Relating Facility Performance Indicators to Organizational Sustainability Performance in Public Higher Education Facilities

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Relating Accepted Facility Performance Indicators with Organizational Sustainability Performance in Georgia Public Higher Education Facilities

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This work is dedicated to the memory of my father, Edward S. “Jack” Adams, the smartest man I ever knew not to have received a college education who, more than any other, inspired and taught me to think critically, and to my mother, Arah E. Adams, whose love and support for me is as fresh today as the day she brought me to this world all these fifty-four years ago.

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LIST OF SYMBOLS AND ABBREVIATIONS

3BL	Triple Bottom Line
AASHE	Association of the Advancement of Sustainability in Higher Education
BOR	Board of Regents of the University System of Georgia
BSC	Balanced Score Card
BTU/SF	British Thermal Units per Square Foot
CAS	Complex Adaptive Systems
CSR	Corporate Sustainability Report
CST	Critical Systems Thinking
ESCO	Energy Services Company
FM	Facility Management
FMs	Facility Managers
FPI	Facility Performance Indicators
FPIS	Facilities Performance Indicators Survey
FTE	Full Time Equivalent
GEFA	Georgia Environmental Facilities Authority
GRI	Global Reporting Initiative
GSF	Gross Square Feet
HE	Higher Education
ISO	International Organization for Standards
LEED	Leadership in Energy and Environmental Design
PPV	Public-Private Venture

SBP	Sustainability Best Practices
SBPS	Sustainability Best Practices Scores
SFTE	Student Full Time Equivalents
SPI	Sustainability Performance Indicators
TBL	Triple Bottom Line
ULSF	University Leaders for a Sustainable Future
USG	University System of Georgia

SUMMARY

Sustainability in organizations is difficult to define and measure, but public and private organizations alike are increasingly reporting sustainability performance through the use of various sustainability assessment methods and frameworks such as those developed by the Global Reporting Initiative (GRI), and others (Bernhart & Slater, 2007). Facility Managers (FMs) need to understand not only how their facilities perform in terms of the established methods like the Kaplan and Norton Balanced Scorecard (Kaplan & Norton, 1996), but also how their units perform in terms of organizational sustainability. An extensive review of the literature is performed and a model is constructed explaining the relationship of Facility Management (FM) to organizational sustainability. New concepts of direct and indirect sustainability roles in FM are introduced. The direct and indirect sustainability roles in FM are assumed to impact organizational sustainability because of evidence from the literature. Drawing from the literature, an assessment method for quantifying sustainability best practices in institutions of higher education is developed as an indicator of organizational sustainability. The method is used to assess sustainability best practices in all University System of Georgia (USG) institutions. Accepted facility metrics from the APPA Facilities Performance Indicator Survey (FPIS) are used as indicators of FM in USG institutions and are tested for correlation with sustainability best practices scores generated in the assessment performed for this research. This work adds to the body of knowledge by furthering understanding of how the work of FMs in higher education (HE) relate to organizational sustainability via a new model and through new concepts

presented defining the direct and indirect roles of FM in organizational sustainability. FMs can use the research to advance sustainability in their respective organizations. Findings might be of use to both the public and private sectors. The sustainability assessment methodology developed for use in this research might be useful to researchers as assessment tools for sustainability best practices both in higher HE institutions and in HE facility departments. The assessments performed in this research could potentially serve as a baseline for comparison of future sustainability best practices assessments for USG institutions. Opportunities for further research are: to assess whether sustainability best practices lead to a state of increased sustainability in the organizations that use them; identification of impacts of other organizational components to organizational sustainability; the study of models for explaining organizational sustainability involving both institutional mission and the size of the institution; the identification of performance measures and assessment methods for the indirect sustainability role of FM in organizational sustainability; and to confirm impacts of the indirect sustainability role with organizational sustainability. Further research performed might be enhanced if focused on one or two HE institutions in order to better drill down into the complex relationships between FM and organizational sustainability.

CHAPTER 1

INTRODUCTION AND LITERATURE REVIEW

1.1 The Sustainability Dilemma of the Facility Manager

The concept of sustainability has emerged from relative obscurity three decades prior to the point where, in 2000, more than 800 companies issued sustainability reports disclosing their respective organization's position toward corporate environmental responsibility and sustainability (Bernhart & Slater, 2007). Many organizations are adopting sustainability reporting guidelines developed by the Global Reporting Institute (GRI). Businesses and other organizations typically report performance in quarterly and annual reports. However, GRI guidelines recommend that organizations also report performance in relation to the wider contexts of sustainability:

> *Information on performance should be placed in context. The underlying question of sustainability reporting is how an organization contributes, or aims to contribute in the future, to the improvement or deterioration of economic, environmental, and social conditions, developments, and trends at the local, regional, or global level. Reporting only on trends in individual performance (or the efficiency of the organization) will fail to respond to this underlying question. Reports should therefore seek to present performance in relation to broader concepts of sustainability. This will involve discussing the performance of the organization in the context of the limits and demands placed on environmental or social resources at the sectoral, local, regional, or global level. For example, this could mean that in addition to reporting on trends in eco-efficiency, an organization might also present its absolute pollution loading in relation to the capacity of the regional ecosystem to absorb the pollutant* (Global, 2007, p. 11).

Many organizations track and report their performance toward their respective definitions of what sustainability is through the use of measurements called performance indicators. These indicators are similar in concept to performance indicators originally

developed to report the financial performance of an organization. Early on, financial performance indicators alone were recognized as insufficient to adequately inform an organization's growth and survival strategies. Subsequently, approaches such as the balanced scorecard (Kaplan & Norton, 1996) broadened the use of performance indicators to business perspectives other than financial, such as the customer perspective, the learning and growth perspective, and the perspective of internal business processes in order to provide a balanced approach to managing business aspects that are equally important to business success as are finances alone. The context of performance reporting is central to the correct interpretation and usefulness of the reporting. Context speaks to the interrelation of the parts of an organization to the whole of the organization as well as interrelations of the organization with local, regional, and global societies, economics, and environments. The subject of this research is a sub-entity of the organization, namely its physical facilities.

Facility managers (FMs) face a dizzying array of complexities in relation to sustainability in their facilities and in the larger context of the sustainability of their organizations and the social and environmental contexts in which the organization exists. Pearce and Walrath (2003) have compiled and cited over 200 different definitions of sustainability from the literature. Pearce and Vanegas (2002) state that, "One of the most significant challenges for applying sustainability to built environment systems is defining exactly what conditions must be met in order for a facility to be sustainable," and that there is no consensus in the literature in how to define sustainability in the built environment. FMs must concern themselves with how facility sustainability fits into the strategic goals of the organization and how the overall organizational sustainability

assessment is affected by its facilities. How to direct resources to achieve sustainability in FM, such as the best use of capital renewal dollars, is another complex issue. Models have been developed for prioritizing and choosing between sustainability project alternatives (Pearce, Gregory, & Vanegas, 2000; Ramkrishnan, 2007). However, these methods are not widely used in the FM environment.

The sustainability complexities facing facility mangers can be mitigated somewhat with the use of performance indicators. Performance metrics are critical to understanding not only how facilities are performing in important aspects of the ownership and operations of facilities, but also in how those facilities perform in terms of sustainability, as well (Pojasek, 2003). Could traditional facility performance indicators help demystify the incredibly complex array of factors that make up the sustainability soup in which FMs find themselves immersed in today's business environment?

Leaders in facility departments of the thirty five institutions of higher education and one research institute that comprise the University System of Georgia (USG) recognize a need for standardized performance measurement and reporting for use in benchmarking, strategic management, and performance improvement. As a result, in 2009, USG facility departments participated for the first time as a cohort in the annual APPA Facilities Performance Indicator Survey (FPIS). APPA is an association of higher education facility professionals from over 1500 institutions in the United States, Canada, and abroad. APPA has conducted the FPIS annually for a number of years. The FPIS consists of critical facility performance data based on the Balanced Scorecard management approach (Kaplan & Norton, 1996). Participation in the survey allows participants to benchmark performance against other survey participants and to track

facilities performance trends over time as a basis from which to improve FM alignment with organizational strategic goals and to improve performance over time in the focus areas of the Balanced Scorecard: financial, internal business processes, learning and growth, and the customer. Although the APPA FPIS addresses facility performance efficiencies and effectiveness critical to the sustained success of the organization, it does not address sustainability in the broader contexts of sustainability performance indicators (SPI) included in the GRI assessment and other sustainability assessment models and frameworks. There is some overlap with sustainability reporting in that some SPI fall largely in the domain of the FMs in most organizations; areas such as energy consumption, water use, waste streams, and emissions. It should be noted that facility performance indicators are most often contributory to, or a subset of, the organizational performance indicators.

"Ownership" of organizational sustainability performance often falls within the operational functional areas of an organization. Many times, sustainability coordinator positions, or similar positions, reside in an organizations FM operation, and are charged with shepherding sustainability accountability and advances within the organization.

This research project explores the nexus between traditional performance measurement in FM and sustainability performance, particularly in facilities owned and operated by the USG. The USG does not currently report its organizational sustainability, but FMs in the USG increasingly understand the impact that facilities have on sustainability and feel the need for reliable measures with which to manage environmental, economic, and social impacts of the facilities which they construct, manage, operate, and sometimes deconstruct. Also, because of increasing pressures for

carbon emission cap-and-trade legislation in the U.S., requirements for increased environmental reporting in the future by all business and governmental entities appear to be forthcoming.

1.2 Background

1.2.1 Overview of Sustainability

With global concerns about atmospheric changes contributing to global warming and an increasing world population placing more and more pressure on our world's ecosystem, global awareness of the concept of sustainability also increases. Much has been written in the past 15 years on the subject of defining sustainability. A very brief review of selected works from this expansive body of knowledge is presented here in order to frame the narrower discussion of sustainability that follows relating specifically to organizational and facility sustainability.

Dresner (2008) concludes his seminal work, *Principles of Sustainability* with this: "Just because we don't know how to create a truly sustainable society, that doesn't mean we can't do things to become less unsustainable" (p. 179). This project is about confirming what FMs might do within their spheres of influence to make their facilities and their organizations 'less unsustainable' until more coherent, coordinated, and universal solutions are presented.

Dresner thoroughly examines the history of sustainability, the current thinking about it, and comments to its future. Dresner notes that, as embodied in the Brundtland definition, the basis if sustainability is equity: equity within the current generation and equity across generations. 'Brundtland' is a widely accepted and often-cited definition of sustainability conceptualized in *Our Common Future,* the report of the United Nations

World Commission on Environment and Development (World, 1987), which was chaired by Gro Harlem Brundtland. The report reads, "Sustainability is development that meets the needs of the present without compromising the ability of future generations to meet their needs" (ibid, p.8).

Dresner discusses sustainability from many perspectives, such as science, social and political ideologies, economics, ethics and philosophy. Dresner notes how technological advances of the industrial revolution propelled by imperialism and capitalism advanced development across the globe to the point of depleting natural resources, jeopardizing the environment and degrading the quality of human existence, especially the condition of laborers. The writings of John Locke and Adam Smith born of the Enlightenment and the Age of Reason fueled new political orders in the New World and the French revolution in the Old. Colonization and international trade began the globalization that continues today with the advances of communications technologies. Dresner documents the beginnings of concerns that the world ecology cannot support such growth as far back as 1798 when Malthus questioned the ability of the world to support the geometric growth of the population. He noted that Romantic writers displayed discomfort with humankinds' pursuit of, mastery of, and disregard for nature such as Mary Shelly portrayed in her work, *Frankenstein*. Dresner notes that, as capitalism advanced across the globe, Marx' competing political economic philosophies were utopian in nature and denied that any limits exist to a liberated society's ability to dominate nature. This led Marxists who followed to disregard the natural impact of rapid development, resulting in the environmental degradation experienced in the former countries of the Soviet Union and others.

Dresner follows developments in sustainability to the most current thinking. He notes political philosophies were once hopeful of the ability of society to dominate what was then considered as a limitless natural environment, or that technological advances or social progress would find ways to compensate for limited resources. However, mechanisms that might have created solutions to environmental degradation such as new technologies, market based solutions, and political experiments such as communism, socialism, and social democracy have either failed or have failed to develop.

Dresner discusses possible social and economic structures that might yet bring about sustainability, but significant barriers remain because they will require either a high degree of central social and economic planning or a very efficient network of small, decentralized sustainable economies, accompanied by the voluntary restriction and reduction of consumption of almost everyone on earth, especially of those who are economically well off, or some combination of all of these. However, elements of these have been tried before without shining successes, especially on a scale that is needed for global sustainability. General pessimism exists about our ability to achieve global sustainability.

Hawkin et al. (1999) build on their previous works in their book *Natural Capitalism*. The work postulates that the industrial revolution was made possible by four types of capital: human capital, financial capital, manufactured capital, and natural capital (p.4). Hawkin et al. propose that natural capital, consisting of natural resources, living systems, and ecosystem services, has not been properly valued nor properly respected by humans. Because much natural capital is irreplaceable, the future of the industrial world, and of humankind, is in jeopardy if we continue to undervalue natural capital and

continue to deplete it. Hawkin et al. theorize that another industrial revolution must take place where sustainability is the primary concern, and natural capital is protected through zero impact strategies, or as close to zero impact as we can possibly come. The book outlines many efforts in various industries that are using sustainable strategies to reduce their impact on and use of natural capital, especially nonrenewable natural capital, and it suggests many more strategies that could be developed in the future.

Narrowing the discussion to topics more pertinent to FM, in his book, Mid-Course Correction, Ray Anderson (1998), founder, chairman, and CEO of Interface, Inc., one of the world's leading interior furnishings companies, tells of his awakening to environmental issues late in his career. Anderson recounts being conscience-stricken by, and drawing heavily from, the works of environmental authors like Ronald Bailey, Joseph Bast, Peter Hill, Lester Brown, Rachel Carson, Paul Ehrlich, Charlie Eitel, Paul Hawken, William McDonough, Daniel Quinn, and others. The reader is referred to these works as fundamental pillars of the birth and development of the sustainability movement. From these works, Anderson realizes the damage to the environment that he and other industrialists have done, and how they externalize the costs of their enterprises onto citizens of the world and onto future generations. Anderson tells a compelling story of how he changed his own thinking, and of changing the culture of his company toward one of sustainability. He gives strategies employed at Interface to achieve results like 20 percent waste reduction in one year, and how he leads attempts to influence the thinking of each Interface employee toward sustainability. Anderson and his associates have become leaders in the sustainability movement as he leads his company toward very

ambitious environmental goals. These goals are well thought out and diagrammed in the book, and could be used as a model for other businesses.

Bell and Morse (1999) discuss the early origins of sustainability, noting six different theoretical 'roots' of sustainability theory that all contain, to some degree, the concept of the carrying capacity of the environment for the human activities that effect the environment. Bell and Morse note that much of the early discussions in sustainability centered around agriculture and development because these two activities have such a proportionally large impact on the environment when compared to all activities. They approach sustainability from a systemic approach, noting the difficulties in defining the boundaries of systems in which sustainability is studied, and in establishing meaningful measures with which to assess the sustainability state of a system. Sustainability theory has evolved from this original focus on agriculture and development to find application in every imaginable human endeavor, to include business and non-business entities and organizations. With the large majority of these exists the same difficulty of identifying the boundaries of the system, the throughputs that effect the system, and how to measure whether the system is in a sustainable state, or not.

Bell and Morse also propose a shift in sustainability investigation that endorses a holistic systemic approach as a balance to the traditional reductionist method where the subject is studied, and ideally unaffected, by an unbiased researcher using the scientific method. With the scientific method, the subject is most often a self contained unit among many discrete units within a system or a larger environment. Bell and Morse make three key observations about research using a systems approach, especially as related to sustainability. First, the system is a defined construct in the mind of the researcher or

researchers [onlooker(s) and/or stakeholder(s)]. Second, the system is a whole and is an entity unto itself. Third, and most significantly, some systems have the ability to change or adapt in order to sustain themselves as the system environment changes (p. 87-88). Because the system is a construct of the observer, systems thinking acknowledges and values multiple perspectives as long as they are justified with careful scholarship and justification. In this work, Bell and Morse go on to develop and present a methodology for the assessment and study of sustainable development they call systemisism. Because of the dynamic and changing nature of organizations, the complexity of the study of sustainability, and the widely accepted practice of looking at organizations as systems, a systemic approach is well suited to the study of organizational sustainability.

1.2.2 Organizational Sustainability

Defining sustainability for any particular area of study, ecosystem, societal institution, organization, or entity is almost always problematic. The literature regularly makes this case (Pearce, 2002; Levin, 1997; Pearce & Vanegas, 2002). Bell and Morse (1999, p. 9) observe, “Almost every article, paper or book on sustainability bemoans the fact that the concept is broad and lacks a broad consensus; this is usually followed by the author’s own preferred definitions, which in turn add to the lack of consensus!” Bell and Morse go on to argue, building on previous works, that it may not be necessary to closely define sustainability to practice it. It appears to be generally accepted that defining sustainability is context or discipline specific.

In a proposal developing an institutional theory approach to studying ecological sustainability for the organization, Jennings and Zandbergen (1995) offer the following discussion that somewhat supports the Bell and Morris concept of the lack of an absolute

need for strictly defining sustainability for the organization in order to make important discovery:

> *In institutional theory, addressing topics like "ecologically sustainable organizations" requires first understanding how consensus is built around the meaning of "sustainability" and then understanding the ways in which concepts or practices associated with sustainability are developed and diffused among organizations. In other words, addressing the sustainability issue does not simply require us to discover the best definition of sustainability and then to identify the best organizational practices, but it helps us to understand how definitions of sustainability are constructed and accepted and then how practices encouraging sustainability are created and adopted over time by organizations, that is, how they come to have a "rule-like, social fact quality" and how they become "embedded" in institutions and organizational fields.*

Jennings and Zandbergen refer to the Brundtland definition previously discussed, but refine this definition to, "…sustainable organizations are those that can survive and profit over the long run in both economic and natural environments." This paper adopts the Brundtland definition of organizational sustainability. However, the previous discussion suggests that strict definition of sustainability followed by the identification of best practices to achieve that sustainability in the most efficient manner might be inferior to, or at least augmented by, understanding *how* sustainability is becoming embedded in the field or "institution" of higher education and, more specifically in the "organization" of the respective campuses. Before continuing this discussion, some differentiation between public sector and private sector organizations is useful.

1.2.2.1 Private Sector Organizational Sustainability

Recent research finds that there exists a substantial gap between stated corporate intentions toward sustainability and actual execution of those intentions (Porter, 2008).

Porter acknowledges that achieving sustainability is based in performance which is most often reported in a company's Corporate Sustainability Report (CSR), but reported performance frequently does not match stated corporate strategic sustainability goals and objectives. Quoting Porter:

> *Thus, on the organizational level of analysis, sustainability refers to actually meeting social and environmental needs in addition to firm profitability, and therefore represents the implementation and outcomes of companies' CSR voluntary intentions* (p. 398).

Porter develops "a process-based approach for managers to implement a CSR strategy at the practical level, based upon theoretical distinctions in CSR positions and in systems approaches to sustainability" (p. 408). Porter concludes that where corporate goals are more concrete and linear, for example with well defined processes and sustainability performance indicators, the traditional functionalist (top-down) systems method of sustainability implementation is warranted[1]. However, two other organizational systems approaches are discussed which diverge from traditional functionalism, Interpretivism and Complex Adaptive Systems (CAS) theories, along with the implications for sustainability implementation approaches within each of these views.

Porter describes Interpretivism as on organizational view in which the individual actors develop mental models that contribute to a whole that is greater than the sum of its parts in order to achieve the objectives of the organization in a democratic, participatory, and inclusive environment. The approach is holistic, subscribing to social constructionist theory, which views social entities as constructs of the combined beliefs and perceptions

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[1] Functionalism is associated with traditional reductionist and mechanistic scientific approaches (Donaldson, 2003, as cited by Porter).

of the systems' actors as opposed to traditional linear and mechanistic organizational view. Porter points out that not all sustainability decisions within the Interpretivist systems view are solvable by democratic processes, and may need intervention with critical systems thinking (CST).

CAS are characterized, according to Porter, by: a) 'self-organization' where elements of and actors within the system tend to interact and arrange themselves without external management b) 'emergence' from a multitude of micro-level interactions coalescing into decentralized points in the organization and co-evolving into aggregate systems behaviors c) 'bottom-up change' where minor variations at the ground level can become major shifts for the organization as a whole a d) the arising and nurturing of creativity and innovation at the intersection of chaos and order in the organization called the 'edge of chaos'.

Porter asserts that all organizations take approaches to CSR that can be classed into four types, regardless of the systems view of the organization. These are compliant, good citizen, instrumental, and intrinsic (Table 1). Compliant and good citizen approaches correspond with sustainability holding a low priority for the organization, while instrumental and intrinsic approaches correspond with sustainability as a high priority for the organization. Compliant and instrumental approaches also correspond with a shareholder orientation of the organization, while good citizen and intrinsic correspond with a stakeholder orientation of the organization (Figure 1). The compliant approach complies with legal and industry requirements while attempting to minimize the impact of sustainability compliance on the core business of the organization. The good citizen approach invites stakeholders in sustainability decision making while balancing

the triple bottom line. The instrumental sustainability approach implements sustainability only in ways that contribute to the bottom line of the organization, while the intrinsic approach is one where sustainability is a part of the core mission, values, and business of the organization.

Table 1: Organizational sustainability approach matrix -Source**:** Porter, 2008

	Shareholder Value	Stakeholder Value
CSR Low Priority	- Minimize intrusion of CSR initiatives into core strategy and business functions - Isolate CSR as a separate function or department with little clout - Comply with legal and industry regulations with minimal change **Compliant**	- Seek input from external stakeholders and include their concerns in decision making - Balance financial, social, and environmental performance (TBL) - Market innovations as evidence of goodwill and good citizenship **Good Citizen**
CSR High Priority	-"Win – win" CSR - Implement only in ways that enhance bottom line performance -Avoid if it diminishes short term results, e.g. revenue or cash flow - Publicize all actions, perhaps leaning towards exaggeration, or "greenwashing" **Instrumental**	- Deep commitment to CSR - Fully integrate CSR into values, mission, strategy and operations - Focus on long term benefits even if CSR initiatives negatively affect short term performance - Marketing of CSR policy and main strategy are intertwined naturally **Intrinsic**

Porter identifies a continuum of various practical sustainability implementation methodologies that can be used to implement sustainability within an organization according to the organization's systems orientation and CSR approach. The choice of methodology is intended to help insure success and to bridge the previously discussed gap that exists between most organizations' stated sustainability objectives and the actual achievement of those objectives.

Porter discusses four implementation methodologies. Two are particularly applicable to interpretive systems, the COMPASS method and Critical Systems Thinking. COMPASS is more relevant to good citizen and intrinsic CSR approaches while Critical Systems Thinking is more relevant to compliant and instrumental approaches. Two methods are particularly applicable to CAS, middle managers divergent strategic activity and incentive schedules and rewards systems. These two methods are appropriate for any of the four CSR stand orientations.

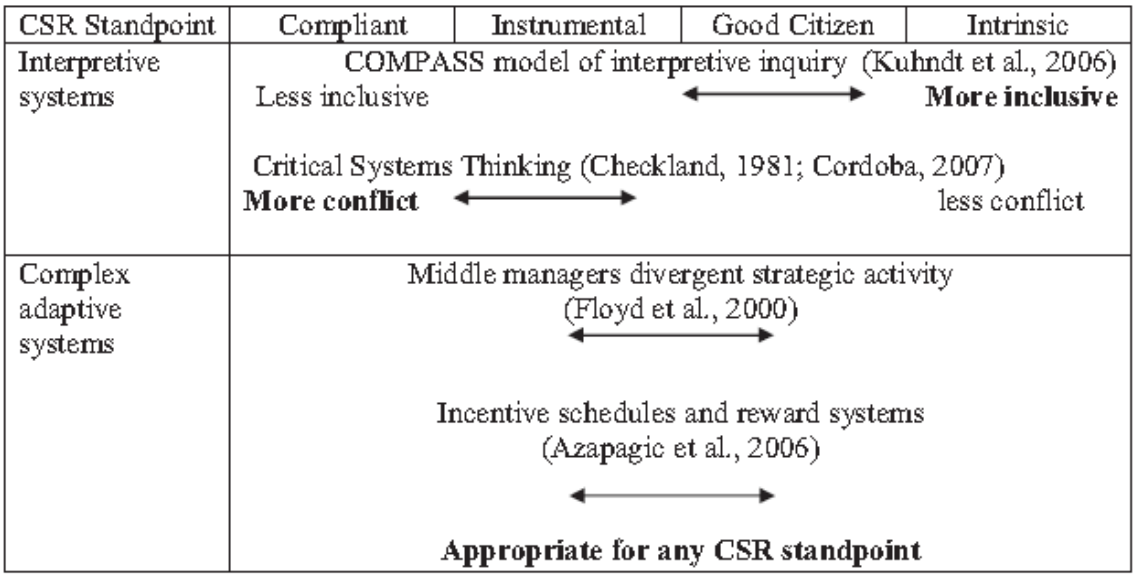

Figure 1: Continuums of intermediate process methods of assessing sustainability progress for different types of CSR standpoints-Source: Porter, 2008
Note: Notations in bold type indicate continuum locations of most likely application for each methodology

Porter expands further on the various implementation methods, cites contributors to the methods, and cites case studies in which the methods have been tested where the reader can obtain more detailed information about each. For the purpose of this paper the implantation methods are briefly summarized.

In the COMPASS method (Porter cites Kuhndt & Geibler, 2006), through successive waves of stakeholder reviews, sustainability issues are identified and then refined. Suitable sustainability indicators are developed for each issue. Finally, specific targets are developed for each indicator. Ongoing review and revision is a component of COMPASS. Efforts are de-coupled and improvement for each indicator proceeds as is appropriate for each.

Porter draws from Cordoba (2007) to suggest an alternative implementation approach to COMPASS, Critical Systems Thinking (CST). CST steps include an initial round of stakeholder discussions to thoroughly vet sustainability issues and concerns of inclusion and power followed by a series of refining design workshops where sustainability issues goals are critically reviewed until consensus for implementation is reached.

Other implementation methods recommended by Porter include structural organizational changes that maximize innovation and information flow in CAS organizations leveraging the roles of middle managers (Floyd & Wooldridge, 2000) and establishing reward systems for innovation and implementation of sustainability within the organization (Anderson, 1999).

Porter's real contribution is to offer an array of practical sustainability implementation techniques that can be methodically applied within a diversity of organizations to actually move them toward a more sustainable position no matter what their organizational systems orientation or their CSR approach. This is particularly important in higher education, because the organizational theories tend to be a mix of traditional, linear top-down systems approaches, as on the operations side of the organization, while being more decentralized and chaotic with negotiated outcomes on the academic side. A blend of implementation approaches is appealing in this environment, while the emphasis of the influence of middle managers, as in the 'middle manager's divergent strategic activity' approach is an important concept for facility FMs, who tend to be middle managers.

However, corporate organizational sustainability in private sector organizations is strategically tied to a profit motive, which varies greatly from public sector organizations, one type of which is the main subject of this paper, namely colleges and universities. There are important differences between the private and public sectors in terms of organizational sustainability.

1.2.2.2 Public Sector Organizational Sustainability

As previously discussed, the centrality of sustainability, or the lack thereof, to an organization's core mission, and therefore its strategy, is key to an organization's approach to sustainability. However, Boyne and Walker (2004) find that traditional strategy research, literature and taxonomies are almost entirely focused on private sector entities and substantial differences exist between the sectors. They argue that, in terms of a matrix of all potential strategic positions represented by juxtaposing the Miles and

Snow (1978) taxonomy of prospector stance, defender stance and reactor stance against five categories of strategic actions, that public organizations will occupy a much narrower range of those strategic positions than will private sector organizations. In other words, their strategic options are more limited. Quoting Borne and Walker, "…they are more likely than their private-sector counterparts to be reactors rather than prospectors or defenders. Moreover, their strategic actions are likely to focus disproportionately on external and internal organization because of political limits on their discretion to pursue new markets, services, and sources of revenue" (p. 247). From this it can be argued that public organizations on the whole have much less flexibility than do private sector organizations in developing sustainability as an organizational strategy.

The predisposition of public sector organizations toward a reactor orientation may be even more significant in light of research performed by Enticott and Walker (2008), who conclude that only a prospector strategic orientation is statistically correlated with increased organizational sustainability in public organizations. For reactor and defender orientations, sustainable management is only correlated with sustainable performance. This implies that what might work for implementing private sector organizational sustainability might not apply to public organizations, especially to rectors and defenders. It is the observation of the author from a vantage point within the USG that, while individual institutions of higher education within the public system have a prospector orientation in terms of student growth, program growth, and expanding research opportunities, the governing system to which these institutions belong often adopts reactive and defensive postures in order to maintain their position among competing governmental agencies and political interests. The governing body has the great deal of

influence on member institutions since the system determines policy and plays a key role in securing and providing resources to implement policy measures within the institutions. The question is: Is 'the organization' the entirety of all USG institutions? Or is it each individual institution? If it is the former, then the organizational sustainability of the reactor/defender USG system might only consist of the actual collective sustainability performance of the member institutions, according to the findings of Enticott and Walker. In other words, the actual sustainability performance at the institution level might be the only measure that correlates with sustainability if the organization is defined as the USG. If 'the organization' is each member institution, then the predisposition of the institutions toward a prospector status might correlate with increased organizational sustainability and the governing body could be considered an external sustainability influence.

Either way, a systems approach is logical to employ. Porter's work is previously discussed offering practical methods for implementing sustainability in the organization. Porter (ibid.) and others widely support a systems approach for transforming an organization to adopt a culture of sustainability (Bell & Morse, 2003; Jennings & Zandbergen, 1995; Pittman, 2004; Sullivan, 2006; van Marrewijk, 2004). It is widely accepted that any effort toward organizational sustainability must encompass a balanced inclusion of all three "stool legs" of sustainability: the environment, economic development, and social equity, otherwise known as the 'triple bottom line', or '3BL'. (Elkington, 1998; Isaksson, 2005; Newport, Chesnes, & Lindner, 2003; Savitz & Weber, 2006).

Pittman (2004) identifies five elements key to systemic organizational change: a clear institutional commitment; a shared vision of the future among

stakeholders in the organization; sustainability indicator reporting (triple bottom line, GRI, etc,); participatory management structures such as focus groups, working groups, stakeholder forums, and organization-wide committees; and external partnerships that support change toward sustainability. Similarly, Dopplett (2003) provides a model for organizational transformation that contains the elements identified by Pittman, but arranged in what Dopplett calls "the wheel of change toward organizational sustainability". A set of seven actions are conceptualized surrounding and connecting to the central objective, organizational sustainability, as spokes in a wheel. Dopplett contends that change can start anywhere in the wheel and can spark activity in other areas of action. Dopplett's change actions are to:

> *Change the dominant mindset…through the imperative of achieving sustainability; rearrange the parts of the system by organizing deep, wide and powerful transition team; alter the goals of the system by crafting an ideal vision and guiding principles of sustainability; restructure the rules of the system by adopting source-based operational and governance-change strategies; shift the information flows of the system by tirelessly communicating the need, vision and strategies for achieving sustainability; correct the feedback loops of the system by encouraging and rewarding learning and innovation; adjust the parameters of the system by aligning systems, structures, policies and procedures with sustainability.*

Dopplett's transformation strategy is designed for private and public organizations, alike.

The focus of this paper is a specific segment of the public sector, higher education. While public higher education is certainly a public sector activity and shares public sector strategic behaviors, higher education as an institution has additional unique characteristics that influence organizational sustainability, as the literature bears out.

1.2.2.3 Organizational Sustainability in Higher Education

Walton and Galea (2005) discuss the differences and tensions between business and universities as they relate to achieving sustainability:

> *Few will dispute the claim that universities are unique places and very different from businesses. Tenure, academic freedom, faculty governance, adjunct and part-time teaching, tensions between teaching and research, and other characteristics make universities the special places that they are. Rosovsky (1990) provides an excellent discussion of how these things shape the university. Sharp (2002) lists several relevant characteristics of the nature of the university, including complexity derived from goal ambiguity, numerous sub-cultures of decision-making styles, and conflict revolving around poorly understood problems (p. 132). Sharp also describes how the mental models held by university faculty tend to be local, and that universities generally do not see themselves as part of a larger, global system.*

Walton and Galea go on to note various arguments as to why businesses choose various corporate stances toward sustainability, all of which revolve around how sustainability affects profit because, after all, producing a profit is the reason businesses exist. However, the mission of universities and colleges is to educate rather than to make a profit, with the possible exception of certain private sector “diploma mills”. Not only are missions different, but Walton and Galea point out the mistrust that exists between faculty and business as business models are increasingly applied to the classroom resulting in the incremental marginalization of faculty as the “new managerialism that pervades higher education, with its focus on corporate mission statements, goals, monitoring procedures and performance measures” (Gough, 2004, p. 158) shifts emphasis from a teaching, or a “motive-oriented” mission, to a learning, or “results oriented” endeavor (Walton & Galea, 2005). Gough (ibid.) expresses the viewpoint that a

business approach in higher education undervalues faculty intellectual skills, academic freedom, equity, and the environment, all of which are important to the pursuit of sustainability. Walton and Galea argue that, in spite of these tensions between business and higher education, that higher education can benefit from business by adopting business best practice in operational areas that both have in common, such as energy management, water management, packaging and waste reduction, facility management, and hazardous materials management. It is particularly germane to this research that, in most cases, all of the common functions identified by Walton and Galea often reside in whole or in part within the responsibility of the role of the FM in higher education.

1.2.2.4 Transforming Higher Education Organizations

This discussion opened noting that a key question for the facility manager is how FM relates to organizational sustainability. Also previously discussed are the findings of some research indicating that, especially in public sector reactor organizations, the act of performing sustainably is most strongly correlated with organizational sustainability (Enticott & Walker, 2008). This finding suggests value to the organization in facilities being managed sustainably even if all of the interconnections of the organization in terms of sustainability are not completely understood. However, a discussion is warranted about how higher education organizations are transformed into sustainable ones (Jennings & Zandbergen, 1995) in preparation for a discussion of the roles FMs might play in organizational transformation toward sustainability.

Bartlett and Chase (2004) edited a compilation of papers about sustainability in higher education finding that effective sustainability efforts emerge from all levels of the university in varying degrees at various campuses; from faculties, administrative units,

and student groups. Emphasis is placed on the foundational shifts necessary within institutions to promote sustainability, with efforts to redesign curricula to infuse sustainability into subject matter and to promote transdisciplinary sustainability instruction, on developing sustainable facility practices, on engaging constituent communities, especially students and faculties, in sustainability awareness and action, and on building a system-wide commitment to sustainability.

In *Higher Education and the Challenge of Sustainability: Problematics, Promise, and Practise,* Corcoran and Walls (2004) edit a compilation of papers focused on recent higher education sustainability efforts, on the evolution of sustainability declarations in higher education signed by many college presidents, on the emergence of sustainability as one of the most pressing issues of our time, and on philosophical frameworks for sustainability in higher education. Various projects are presented highlighting efforts of several institutions to promote sustainability on their respective campuses.

Efforts to bring about sustainable universities are varied. Thompson and Green (2005) recognize this from efforts they studied at the University of Rhode Island and from the literature. Thompson and Green note that, while strong support from top institutional leaders is a distinct advantage to sustainability efforts on campus as in the case of Emory University in Atlanta, Georgia, such support is rare. Quoting them:

> *While committed leadership from the top has immense value, we argue that the process of incorporating sustainability into the life and mission of an IHE* (Institution of Higher Education) *will often involve a relatively small and stable group of faculty and staff. These core leaders will work with a fluid, ever changing coalition of faculty, staff, students, and administrators. These coalition members will have overlapping, but differing, incentive structures and, hence, various levels of commitment. Regardless of their incentive structure, all*

> *members of the coalition will repeatedly calculate the opportunity costs of participation and adjust their participation accordingly.*

A strategy is given where this dedicated, stable core of sustainability supporters can foster transformation on campus by recognizing barriers to sustainability and working to overcome them through efficient dissemination of information about the needs and opportunities to act, and by creating rewards for acting. The second plank of the strategy is to take advantage of windows of opportunity. The third component of the strategy is to "create sites of unconventional wisdom" through which conservation of existing resources is demonstrated and natural sites are restored to their original states. Such projects serve to demonstrate to stakeholders how much impact the institutions of higher education (as well as all modern entities) have had on the natural environment and raise the awareness of stakeholders of the need to design, build and operate facilities in a sustainable manner so as to minimize detrimental impacts. An example of such a project is Emory's eco walking tour (Bartlett, 2002). The key to the success of the Thompson and Green strategy is to elevate sustainability to the "action agenda" of the institution, if it does not already reside there.

The implication for FMs today in higher education is that they are not likely to find themselves mandated to instill sustainability on campus, nor necessarily supported by upper level management in their efforts to implement sustainability. Rather, it is much more likely that FMs focused on sustainability on campus will find themselves a part of a core group of sustainability constituents in the organization searching to find creative ways to network with others to overcome barriers to sustainability in the organization by capitalizing upon opportunities that present themselves to demonstrate sustainability

through discrete projects that will, in best-cases, ignite further action toward sustainability which eventually become a part of the strategic plan of the organization.

1.2.3 Barriers to Sustainability in the Organization

As with any transformational change, barriers exist in organizations which must be overcome in order to achieve sustainability. Thompson and Green (2005) note several common barriers to sustainability in institutions of higher education. Stakeholders often fail to recognize or accept the need for sustainability. Also, clinging to faulty cultural models can inhibit the cultural change needed to develop new models fostering sustainability. Additional barriers to action occur when stakeholders incorrectly perceive and process sustainability concepts even after they have been taught them. An example is given of the choice of installing a pervious parking surface rather than an impervious one at the University of Rhode Island only after decision makers were presented the calculation finding that nine million gallons of water would be returned to the aquifer by choosing the impervious surface over the previous one. Other barriers to action occur, Thompson and Green continue, when individuals rationalize inaction trough the mechanisms of dismissing and/or diminishing either their contribution to the problem or their ability to affect change, or by distancing themselves from them problem by making it someone else's responsibility. Limited time and resources also present barriers to acting to create sustainability on campuses.

Ferrer-Balas, et al. (2008), find several barriers to sustainability in higher education. The freedom of individual faculty members can inhibit prescriptions for change in the organization. Seldom do salaries, promotions, granting of tenure and other incentive structures recognize individual contributions toward organizational

sustainability. Often, there is within institutions a desire to maintain the status quo when the institution is doing well, providing resistance to transformational change. Ferrer-Balas, et al., note that external forces act on institutions, as well, and if those forces do not drive the institution to change, change is much less likely to take place.

In a study of sustainable construction practices at the University of Waterloo, Richardson and Lynes (2007) find that barriers and motivations to sustainable construction on campus, consistent with those found in the literature, fall into two categories, organizational and financial. In terms of the organization, barriers to sustainability when absent, or motivators when present, are organizational leadership, sustainability target measurements, and collaboration between institutional sectors such as researchers, designers, and FM personnel. Financial barriers include negative perceptions of green buildings in general, perceptions in the marketplace of a high initial cost associated with sustainable construction (although research is mixed in its findings as to whether initial costs are higher), and the lack of incentives for actors to construct buildings that perform sustainably.

Lack of incentives is also among barriers identified by Lawrence et al. (2005) to the installation of high efficiency heating, ventilation, and air conditioning (HVAC) equipment. Their findings and recommendations are given in Table 2. Although Lawrence et al. list obstacles specific to the installation of high efficiency equipment, these barriers are common to the broader effort to increase sustainability in a large building portfolio such as exists on many college campuses. A discussion follows of the more pertinent barriers to acquiring sustainable buildings for one large public sector building portfolio owner, the USG, using the categories defined by Lawrence, these being

Table 2: Barriers to the installation of high efficiency heating, ventilation, and air conditioning equipment - Source: Lawrence et al., 2005.

BARRIER	GENERAL DESCRIPTION	POTENTIAL REMEDIES
Ownership	Those who make decisions about energy equipment may not pay operating costs.	Need for increased education and communication by and between owner and lessee. Encourage alternate lease structure.
Technical	For example: Will the equipment work as promised? Is the equipment compatible with other (existing) systems?	Encourage public and private research and development programs. Encourage technology compatibility and standardization.
Baseline Information Costs	Answering questions like, "How much do I spend on energy?" can be expensive.	Annual Cost-To-Date billing from energy providers.
Technology Information Costs	Accessing information to analyze energy efficient equipment can be expensive. Information regarding compatibility with existing technology and estimation of benefits is important.	Include charts/calculators to convert energy savings to dollars in marketing materials for energy efficient technologies, or provide energy savings calculation software. Cooperative advertizing of energy efficient concepts.
Capital Constraints	Private sector borrowing constraints. Public sector legal restrictions on borrowing.	Subsidize borrowing through low-interest loans for adoption of energy-saving equipment.
Interest Rate Uncertainty	Rising interest rates decrease attractiveness of future cost savings.	Encourage no- or low-interest loans for new equipment through tax breaks, etc.
Bounded Rationality	Reluctance/inability of business leaders to assess impacts of non-core business activities on overall performance.	Education to encourage business leaders to recognize their energy expenditures. Provide imperatives for lowering energy consumption.
Energy Price Volatility	As energy prices fall, rate of return for energy efficient equipment also falls. Risk adverse firms may not want to "bet" on future energy costs since pat performance has been volatile.	Education to focus on the ability of energy-saving equipment to reduce cost variability even if energy prices are low.
Cost Amortization	Equipment is a capital expense for which current tax policy requires amortization over time.	Modify tax code to allow more rapid (current year) depreciation.
Discounting/ Planning Horizon	Business leaders heavily discount the future and have short planning horizons, thus preventing adoption of technologies where the benefit occurs in the future but the costs are incurred today.	Subsidize borrowing to lower the effective discount rate business leader's use. Provide information on returns to technology for various interest rates and various energy prices. Policy changes such that entities take into account the full life-cycle cost effects of system selection and encourage long-term planning horizons.
Negative Externalities	Negative externalities arise when the user of a resource does not bear the full cost of its use. For example the price of gasoline does not include environmental and human health damages from burning it.	Incorporate as much as practical costs into energy prices, For example, tie the funding of governmental environmental programs into a tax on fossil fuels. Cap and trade programs for certain pollutants. Tax for energy security on oil.

ownership structure, technical, baseline information costs, information technology costs, capital constraints, bounded rationality, and negative externalities.

The USG owns and operates a portfolio of buildings consisting of a mix of institutional instruction space, research facilities, resident halls, athletic facilities, administrative offices, and student services facilities that, in 2005, totaled nearly 71.5 million square feet in 3,169 buildings valued at more than $6.7 billion. Only 1,189 of these buildings were less than 25 years old in 2005. As the USG begins to grapple with the prospect of greening this massive portfolio of buildings, many of the obstacles identified in Table 2 are present.

Ownership Structure – USG buildings are owned and operated by the State of Georgia through the Board of Regents (BOR) of the USG. The BOR is considered the landlord, while individual institutions are considered tenants. The BOR and the individual institutions share responsibility for building, maintaining, and operating facilities to accomplish the mission of the USG. Decision making is shared with or distributed among key personnel at the member institutions such as college presidents and business officers, more so than in private business where standards can be more tightly set and controlled throughout the organization. These complex owner/tenant relationships in the public arena present complications to the implementation of sustainable building projects that private sector entities do not face, or face less often. Support for sustainable buildings must be agreed upon on many more levels than in the private sector. The governor, the legislature, public opinion leaders, and institution presidents and stakeholders must come together in order to create sustainable buildings.

General responsibility and oversight at the system level for campus master planning, capital construction, major renovation, maintenance, and operations of the facilities of the USG is provided by BOR staff in the Office of Real Estate and Facilities (OREF). The USG consistently engages industry professionals as a matter of policy and procedure to guide planning and design decisions for all new major capital projects and capital renewal projects. Planning and design guidelines are issued by the BOR facilities office. A review of these guidelines finds that sustainability is not yet incorporated into the design process as of this writing. While adherence to applicable energy codes is required, more stringent energy guidelines are not required. Interviews with BOR staff reveal that updates of design guidelines are planned and that both sustainability and various energy efficiency requirements will be incorporated.

USG institutions, especially those institutions with the ability to manage projects under authority delegated to them by the USG, are able to pursue sustainability in those projects, and some have done so with the pursuit of Leadership in Energy and Environmental Design (LEED) certifications for some capital projects, by establishing campus-level sustainability guidelines. Some USG institutions have established staff positions that coordinate sustainability efforts across campus sectors in addition to facility-related sustainability issues, such as sustainability awareness, student activism, faculty involvement, and external partnerships.

Funding for capital projects is largely accomplished through bond sales authorized on an annual basis and is further detailed below. Operations and maintenance funds are awarded annually using a formula based on a multiplier and the quantity of state-owned square feet of space at each institution. These funding streams are

completely segregated and no financial incentive exists to directly incentivize actors to construct higher performing buildings. In fact, the opposite is true. Since operations and maintenance funding is based on square feet of space, an incentive is created to increase the square feet of space constructed, potentially at the expense of cutting construction costs dedicated to increased building performance.

Technical – Recognizing the need to increase energy efficiency and sustainability in state buildings, the State of Georgia passed the Energy Efficient and Sustainable Construction Act of 2008. The act requires an increased level of energy and water use efficiency in state buildings built after July of 2010. Efficiency gains will be attained by adherence to tighter energy and water standards, through building commissioning that verifies performance of building systems as they are designed to work, and through allowing state agencies to go beyond the base energy use requirements of ASHREA Standard 90.1 by up to 30% additional energy savings if the cost-to-benefit is validated through the use of energy modeling in the design phase of the project.

With the passage of this act, the State of Georgia has implicitly recognized some of the technical barriers to sustainability and has taken first steps toward overcoming this type of barrier. Basic building energy and water efficiency performance and verification of that performance through building commissioning is required and even greater building sustainability performance is allowed at the discretion of the agency if it can be substantiated with energy modeling.

Baseline Information Costs - The USG is mobilizing to address the problem of establishing a baseline of its energy use. There are several layers to the efforts; state level, USG level, and institutional level. Attempts are being made by the State of

Georgia to capture energy use data for all state facilities through the Georgia Efficient Facilities Authority (GEFA). A software program, ECAP, is being used to build a database of state facilities energy use. Because USG buildings are not all individually metered, data cannot be compiled for each individual building. In many cases, meter data can be collected automatically from utilities that offer web-based reporting, but not all do so. In addition, The Georgia Building Authority currently has an initiative under way to establish total cost of ownership for every State building.

A long-term USG system-wide energy management plan has been developed that includes the eventual metering of most or all buildings and major energy sources in the System. The Sustainable Energy Management Plan was developed by a team headed by University of Georgia President Michael Adams at the direction of USG Chancellor Erroll B. Davis, Jr., containing members from across the System (University System of Georgia, 2007). The plan was adopted by the Board in the first half of 2008. Resources have not yet been identified to fully fund this effort. Among other measures, the plan calls for the establishment of baseline energy data from which to gage the effectiveness of energy improvements. Because not all buildings in the USG are individually metered, much less major component loads to buildings, an initial thrust of this plan is to provide effective load measurement via metering.

Metering efforts and monitoring of meters will occur at the campus level. Metering efforts will be most effective if data can be gathered and reported remotely to concerned parties such as the USG central office and GEFA. The impact of energy improvement efforts can then be much more effectively measured, as well. However,

hindering the effort to install metering and measurement technologies is another common barrier, capital constraints.

Capital Constraints - A fall 2005 report (Pearce, Bosch, Carpenter, & DuBose, 2005) documents the difficulty of gaining support for sustainable construction in the public arena. The report finds that among approximately $600 million to $1 billion in annual new construction by the State of Georgia, only a handful of sustainable projects are identified, suggesting that sustainability-focused initiatives are in their infancy in the Georgia public facilities arena. The report was commissioned by the Georgia Efficient Facilities Authority to gage the 'climate' in the State for green initiatives. The report identifies additional barriers to sustainable development in Georgia as well as nine other states. In the public sector, support for sustainable buildings must be agreed upon on many more levels than in the private sector. The governor, the legislature, public opinion leaders, and institution presidents and stakeholders must come together in order to create sustainable buildings.

Funding for capital improvements is provided annually to the USG through the state budgeting process on recommendation from the BOR and funded through general obligation government bonds. Capital renewal funds are provided annually through the state budgeting process according to a formula factoring total resident instructional space and the age of the space. Capital renewal is funded through a mixture of cash and bonds. USG capital projects compete with all State construction projects for the same pool of bond funds.

Various levels of authority are delegated to USG institutions by the BOR to manage capital and capital renewal projects locally with minimal involvement by the

central office of the USG. Political dynamics sometimes influence funding of capital projects and complex state procurement codes and requirements further complicate choices of consultants, contractors, technologies and methods.

Common strategies exist and are used by public sector entities to augment funding for capital projects beyond the issuance of bonds. Some of these are public-private ventures (PPV's) and paid-from-savings performance contracts PC's. In PPV's a ground lease of public property is issued to a private company for a set period in which the company performs a capital project that generates some sort of revenue. The private company is repaid for the investment plus a profit from this revenue stream before the ground lease terminates and the property reverts to control of the public entity. For the last 15 years the USG has increasingly used PPVs for constructing certain types of new facilities such as student housing, parking facilities, and some instructional space. However, PPVs present certain inherent barriers to building sustainable buildings. The pressure to maximize profits drives initial investment in building materials and technologies. There is often reluctance to invest in the typically more costly initial construction options that yield increased energy efficiency and sustainability, especially if utilities costs are paid by a third party. Once a facility is built, sustainable renovations and retrofits become much more expensive to perform than if sustainable choices are included in the original design, making it much less likely that they will ever be performed. The energy intensity of the PPV-delivered project is then increased for the life of the facility, total cost of ownership increases for all stakeholders, and the total impact on the environment increases.

PPVs are not a good vehicle for providing sustainable projects for capital renewal for existing facilities. The property leases essential to PPVs become much more complex in existing facilities than for new facilities. For example, consider how only a portion of a building might be leased for a capital improvement without the remainder of the building also being leased. How is the revenue stream generated? And verified? How are lease agreements structured? Despite inherent barriers PPVs present to providing sustainable facilities, their use is on the rise due to pressures to find alternative funding for State facilities. Since 1990 the USG has engaged in 96 PPV projects totaling $2.552 billion, 18 of which, or 19 percent of the total number of projects, were initiated in 2007 or later (University System of Georgia, 2008).

For many public and private sector organizations, energy service companies (ESCO) provide creative alternate funding sources for energy projects. The U.S. Department of Energy defines ESCOs as:

> *An ESCO, or energy service company, is a business that develops, installs, and finances projects designed to improve energy efficiency and reduce operations and maintenance costs for its customers' facilities. ESCOs generally act as project developers for a wide range of tasks and assume the technical and performance risk associated with the project. What sets ESCOs apart from other firms that offer energy efficiency improvements is the concept of performance-based contracting. When an ESCO undertakes a project, the company's compensation is directly linked to the amount of energy that is actually saved.*

However, multi-year performance based contracts that are paid from energy savings have not been successfully implemented in Georgia due to a prohibition in the Georgia state constitution against committing the State to debt. State attorneys general have interpreted

this clause to mean that the State cannot legally engage in the multi-year contracts that must be executed in order to make performance contracts work financially.

Bounded Rationality - As stated in Table 2, bounded rationality is the economic phenomenon observing the "reluctance/inability of business leaders to assess impacts of non-core business activities on overall performance" (Lawrence et al., 2005). Bounded rationality may be even more pronounced in public sector entities than in the private sector because public sector entities do not measure performance using the same metrics as private sector business. The lack of need to show profit may discount the importance of utilities costs savings in the public environment and therefore lessen the desire on the part of decision makers to invest larger capital outlays in energy efficient and sustainable facilities. In the USG, maintenance and operations funds are provided according to formulas that factor in enrollment, resident instruction floor space, and anticipated utilities costs. Therefore, the acquisition of additional floor space where instruction (core business) takes place combined with the potential for increased funding that accompanies both increased floor space (potentially in lieu of increased investment in sustainability and energy saving technology) and increased utilities budgets reinforces bounded rationality where decision leaders do not give appropriate weight to the affect of unsustainable facilities on their organizations.

One example of bounded rationality is when campus leaders push to tear down re-useable older buildings in order to build new buildings on the same site. These decision-makers often have difficulty seeing past the glamour and positive publicity generated by receiving new facilities on a campus when the actual structure of the older building is sound, the building can be completely rehabilitated and adapted for current needs for less

money than it takes to tear down the building and construct another, adaptive reuse is a much more environmentally friendly choice, and the positive press for taking a green action such as adaptive reuse may even exceed the goodwill generated with a new facility when presented properly.

Negative Externalities – Public entities tend not to pay the full cost of externalities associated with energy consumption and poor environmental performance. The solution that Lawrence et al. propose to this barrier is to incorporate tax penalties, regulations, and other financial mechanisms such as the trading of carbon credits to more fully represent external costs in energy prices. However, public entities tend to exempt themselves from such practices in order to keep operating costs low. In addition, energy suppliers often give some of their best rates to large public entities. For example, USG institutions currently pay some one of the lowest rates available from the largest electric supplier in the state of Georgia, putting downward pressure on energy efficiency capital improvement investments in the public sector.

1.2.4 Sustainability Drivers and the Role of FM in Organizational Sustainability

Just as there are barriers to organizational sustainability, there are drivers of sustainable transformation that provide the energy necessary to overcome those barriers. Ferrer-Balas et al. (2008) identify sustainability drivers in higher education as visionary leadership coupled with sustainability champions who often act independent of main stream forces and status quo. In addition to leadership and champions, networks of people who Ferrer-Balas et al. call “connectors” tie together various sectors of the university to help reach a “critical mass of campus actors” to achieve sustainability transformation. It is noted that the size of the university can be a driver, smaller

institutions being less complex present a more manageable transformation. And also the existence of a coordinating unit and/or project catalyzes and sustains the transformation. External drivers can be peer pressure from other institutions and funding opportunities.

Beringer's research (2007) seems to support the Ferrer-Balas et.al., "critical mass" concept as follows:

> *Lüneburg, UBC and others - e.g. Harvard, Yale - demonstrate that a combined expertise in organizational leadership and management, operations, and academic research/scholarship and education are required to tap unfulfilled SHE* (sustainability in higher education) *synergies, and to realize these; synergies marked by accelerated progress which, it seems, only appear once a multi-stakeholder process is secured and a certain tipping point of cross-sectoral commitment and multi-/trans-disciplinary functioning has been reached ([43] Stokols, 2006; [40] Schoot Uiterkamp and Vlek, 2007).* (p. 446)

The drivers identified above (Ferrer-Balas et al., 2008) are consistent with organizational transformation strategies previously discussed (Porter, 2008), especially for the COMPASS, CST, and Middle Manager Strategic implementation strategies that Porter identifies for use in transforming an organization to sustainability at the direction of the leadership of the organization, but executed systemically by distributed networks of actors using a project or methodological framework to drive transformation. However, some researchers point out that, while high-level leadership is helpful as a driver, that champions, networks, connectors, coordinators, and/or projects (opportunities, events, and the like) are most critical to sustainability transformation in the organization (Thompson & Green, 2005). But what part do FMs play in this mix?

1.2.4.1 The Role of FM in Organizational Sustainability

In comparing sustainability transformations in several universities in North America to several outside of North America, Beringer offers the following about the typical North American university approach to sustainability, indicating a need for a more systemic, integrated, and cross-sector approach for facility departments focused on achieving sustainability in the organization:

> *While this is a tentative conclusion requiring further empirical inquiry, a significant insight for North American institutions arising from this analysis may be that the conventional "Sustainability Coordinator approach" - i.e. a staff position at a chosen administrative level within facilities management and reporting to a vice-president operations, frequently with an engineering background and largely independent (isolated) from academe - may not be the most effective and efficient vehicle for a two-pronged, combined "top-down" and "bottom-up" strategy of institutional transformation.*(p. 446)

However, the prevalence of the "sustainability coordinator approach" that often resides in facility departments as noted by Beringer seems to be an intrinsic endorsement or awareness on the part of universities that facility departments are logical places to foster the implementation of sustainability. A discussion of why this is the case follows using examples from the literature and the lines of reasoning previously developed in the background discussion above.

FMs tend to be middle managers. As noted in the previous discussion of implementation strategies identified by Porter (ibid.), the importance of middle managers in organizational change is commonly recognized, as in the middle managers divergent strategic activity strategy.

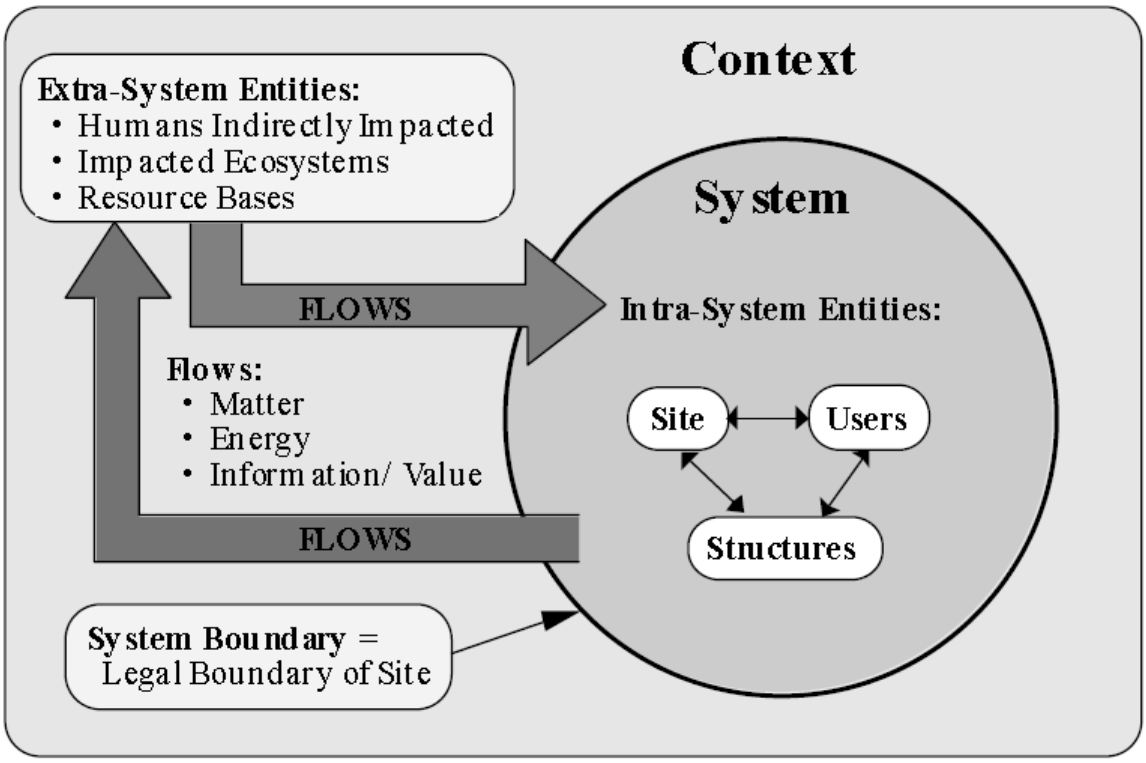

Figure 2: Entities and flows of a built facility system-Source: Pearce & Vanegas, 2002

Facility departments of universities directly manage the planning for, construction or leasing of, operations and maintenance of, and disposal of the physical assets of the institution. Walton and Galea (2005), as has been discussed, identified areas common to the private sector and universities wherein private sector best practices in sustainability could be adopted by universities. Many of those areas fall under the responsibility of facility departments, functions such as energy management, water management, packaging and waste reduction, facility management, and hazardous materials management. Accordingly, FMs have an increased opportunity over many in the higher education organization to minimize environmental impacts and influence sustainability.

Yeang (as adapted by Pearce & Vanegas, 2002) diagrams how built environments affect their environmental context as resources, matter and energy flow into and out of built systems across built system site boundaries (Figure 2). Much of this throughput belongs to the realm of FM.

Because research shows a strong correlation between actual sustainability performance and organizational sustainability performance, as discussed above (Enticott & Walker, 2008), it is proposed here that the act of performing sustainably in the facility realm contributes to organizational sustainability even when other systemic components or transformational forces might not be present. However, the literature overwhelmingly supports the view that a systemic, integrated approach to organizational sustainability is most effective, leveraging the efforts of individual sectors in the organization to promote sustainability (Bell & Morse, 1999; Pittman, 2004).

Perhaps the highest impact that FMs might have on organizational sustainability in higher education is in the role of sustainability champions and connectors (Beringer, 2007; Porter, 2008; Thompson & Green, 2005). Uhl (2004) hails the Plant Operations department as the "unsung heroes" in contributing to transformational sustainability efforts at Pennsylvania State University. Bartlett (2004) indicates that the FM department at Emory University had been a part of a decade of work that "laid the groundwork of campus awareness of willingness to act" in advance of the 1999 establishment of the Ad Hoc Committee on Environmental Awareness, in which Facilities also participated. Emory's advances in sustainability as a university are now widely known and respected among institutions of higher learning. Orr (2004) tells how the Adam Joseph Lewis Center at Oberlin College was designed and constructed to be a

high performance building to serve as a living sustainability laboratory for the campus to be integrated with the curriculum. The Center spawned subsequent sustainability projects at Oberlin.

Another key area where FMs can act as sustainability drivers is in providing projects and events in which transformation can take place, gain momentum, and provide a locus of engagement for leaders, champions, and connectors to converge to advance sustainability in the organization toward a tipping point. Certainly, many of those opportunities exist within FM, maintenance, and operations. Comm and Mathaisel (2003, 2005) identify connections between lean manufacturing techniques and sustainability, and identify areas in higher education where opportunities exist to practice 'lean'. The use of energy services companies (ESCOs) to accomplish sustainability projects on campus (Pearce & Miller, 2006), demonstration projects in high efficiency student residences (Shelley, 2003), the abundance of LEED certified and other high performance buildings currently being constructed on campuses: the list of examples of sustainability efforts on campus that are being undertaken by higher education facility departments around the world are, no doubt, countless as well as contributory in some degree to sustainability in higher education.

1.2.4.2 Introduction of the Concept of Direct and Indirect Roles of FM in Organizational Sustainability

Figure 3 is a model postulating the potential of the collective activities associated with FM to affect sustainability in the higher education organization that is a

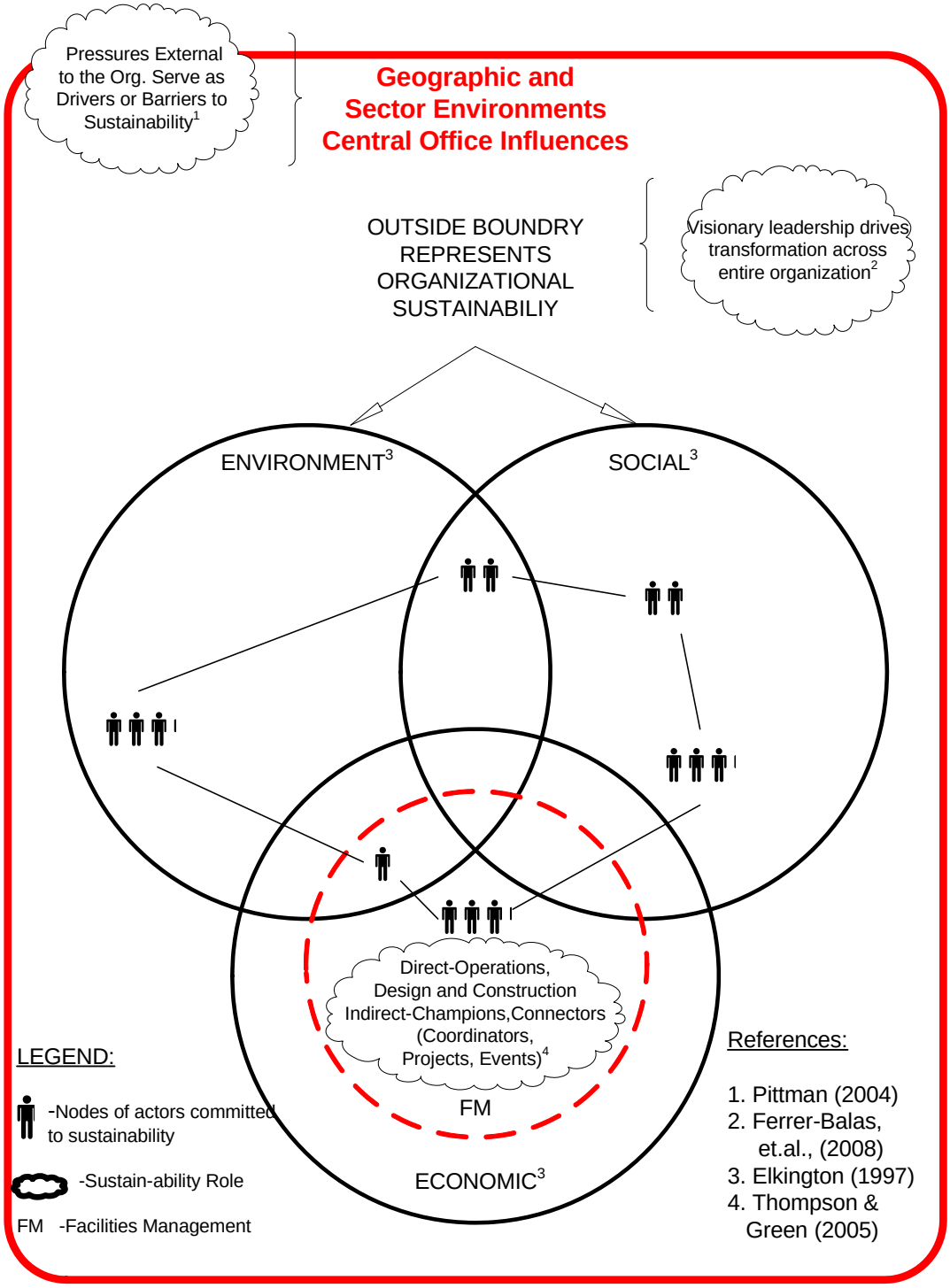

Figure 3: Facilities management roles in organizational sustainability in higher education institutions: a synthesis from the literature

synthesis of concepts found in the literature and previously discussed in this paper. The higher education institution exists in the larger environment of the region or sector to which it belongs. Influences in the environment external to the organization can exert pressures on the organization to promote or discourage sustainability (Pittman, 2004). The totality of organizational sustainability exists within the boundaries of the triple bottom line constructs of economic, social, and environmental impacts (Elkington, 1998). Organizational sustainability can be advanced through visionary leadership which helps drive the culture throughout multiple segments of the organization, though it is not absolutely necessary to the development of a sustainable culture (Ferrer-Balas et al., 2008). Higher education institutions are led to a tipping point toward sustainability through the actions of sustainability champions within the organization in connection with a network of sustainability actors distributed through the organization who capitalize on events, projects, and/or sustainability coordinator positions that act as 'connectors' to provide the impetus and opportunity to move the organization toward sustainability, and to grow support for sustainability (Thompson & Green, 2005).

Evidence from the literature demonstrates the influence of facility departments in advancing sustainability within various institutions of higher education through the provision of sustainability champions and through projects such as sustainable construction, recycling, and sustainable housing projects that serve as connectors for nodes of sustainability actors throughout the organization to rally around and in which participants drive the organization toward a critical mass, or "tipping point" of sustainability. These FM sustainability activities are conceptualized by the author as the 'indirect role' of facility departments in organizational sustainability in higher education,

and shall be referred to as such hereafter in the paper. The author further argues that FM plays a 'direct role' in organizational sustainability through those operational aspects that are directly under the control of FMs and can directly affect the organizational constructs of economic impacts, social impacts, and environmental impacts. Sustainable performance in these areas has been correlated with sustainable performance in the organization (Enticott & Walker, 2008). This more direct aspect of FM influence over organizational sustainability shall be referred to hereafter as the 'direct role'.

The model facilitates understanding the relationship between FM and organizational sustainability in higher education as evidenced by the literature. However, the literature contains little in terms of measuring the strength of the relationship. Intuitively, one would expect the direct role to be more easily quantifiable than the indirect role. In order to test the strength of the relationship, methods for assessing sustainability in higher education must be discussed.

1.2.5 Assessing Sustainability in the Higher Education Organization

Hubbard (2009) gives synopsis of historical organizational performance assessment over the past twenty-five years, and offers a method for incorporating sustainability assessment into current practice using a Sustainable Balanced Scorecard assessment. Hubbard notes that for the past twenty years, or so, the two dominant business organizational behavior theories were shareholder theory in the 1980s, giving way to stakeholder theory in the 1990s. Shareholder theory is based on the concept that a company exists only to create value for shareholders and focuses heavily upon financial performance. Stakeholder theory broadens corporate responsibility to protect the interests of groups of individuals who have interests that are affected by the company beyond

purely share performance, and charges the organization with tracking performance in stakeholder terms as well as in financial terms. Stakeholders include groups such as customers, employees, suppliers, and communities. Kaplan and Norton (Kaplan & Norton, 1996) developed the Balanced Scorecard (BSC) assessment method based on stakeholder theory in order to balance corporate performance assessment of the financial perspective (shareholders) with value created in three other perspectives, customer, internal processes, and the learning organization, representing a broader set of stakeholders.

Hubbard continues his synopsis by noting that, concurrently with the beginnings of the use of the BSC, a groundswell developed in public and academic organizational theory thinking holding that corporations are responsible, not only for economic value to stakeholders, but for their impacts to society and to the environment. BSC did not capture these concerns, and Triple Bottom Line (3BL) was introduced by Elkington (1998) which measured performance in three dimensions, economic, social, and the environment. However, 3BL has not gained the widespread use among organizations that has BSC.

Hubbard goes on to present four conceptual approaches for assessing organizational sustainability, the System Model, the Quality Approach, the Triple Bottom Line, and a modification of the Balanced Score Card, the Sustainable Balanced Scorecard (SBSC). Hubbard prefers incorporating sustainability into BSC or 3BL. He argues that BSC gained such widespread use because it presents complex organizational issues in simple, visual terms by using a handful of performance indicators in four quadrants, and that most sustainability assessment and reporting tools being developed today are so

complex as to render them impractical for widespread use. Indeed, there is no generally accepted sustainability assessment standard available to organizations today.

Pojasek (2003) argues that, exactly because sustainability is a complex issue, difficult to measure, and is not consistent from organization to organization, the 'Baldridge Model' for assessment associated with the Malcolm Baldrige National Quality Award program is the best assessment tool to use to assess sustainability because it tracks results rather than simply performance, as do other assessment models using performance indicators. Pojasek points out that good performance does not guarantee the desired result, and that sustainability is about getting the result the organization desires in terms of its self-determined sustainability goals.

The Global Reporting Initiative (GRI) claims to be "the world's most popular sustainability reporting framework". The organization publishes reporting guides to help standardize reporting. Over 1,000 organizations filed a mix of sustainability, environmental responsibility, and corporate social responsibility reports with GRI in 2008. However, very few of these were universities. GRI hopes to increase standardization of its report and benchmarking capabilities for participants as use of the assessment tool increases.

Taddei-Bringas, Esquer-Peralta, and Platt-Carrillo (2008) examined the use in higher education of the International Organization for Standardization standard 14001 (ISO 14001) developed for improving environmental management processes to see if there was a correlation between the use of ISO 14001 and the sustainability of the higher education institution. The researchers found that, in every case analyzed, the use of ISO 14001 advanced sustainability in the institution. However, because ISO 14001 is a tool

for documenting and improving environmental management processes, adaptations were necessary to the assessment system to make it relevant to the less tangible aspects of the core business of teaching rather than the more tangible aspects of the industrial sector for which it is originally designed and to extrapolate the measures to sustainability rather than simply environmental management for which it was designed. In addition, a typical implementation period is said to be three years, giving an indication of the complexity of the standard and the degree of difficulty in implementing it.

Indeed, it appears that the intangible aspects associated with higher education present the biggest challenge when it comes to assessing organizational sustainability and making comparisons across organizations. In an effort to increase sustainability at Pennsylvania State University, thirty-three sustainability indicators were employed (Uhl, 2004). Most of these indicators, however, tended to measure operational aspects and physical performance of the university, such as water and energy conservation, recycling, and building design. Shriberg (2004) notes a common weakness in assessment tools: they measure eco-efficiency rather than true sustainability. Quoting Shriberg:

> *The distinction is crucial as eco-efficiency indicators stress material utilization, environmental performance and regulatory compliance, while sustainability indicators stress issues at the nexus of the environment, society, and the economy with the goal of no negative impacts (O'Conner 1995). …The difference is of mindset in promoting incremental (i.e. eco-efficient) or systemic (i.e. sustainable) change; eco-efficiency ends with the incremental wile sustainability incorporates both approaches.*

Shriberg goes on to evaluate and compare ten assessment tools, concluding that the best assessment tools focus on decreased consumption and throughput, the centrality of sustainability as incorporated in core curricula, cross functional integration to all sectors

of the university, the ability to compare results across institutions and for society at large, and using systemic measurements as well as incremental ones. Shriberg recognizes that the need for a universal assessment for universities is debatable because it could result in a loss of criteria important to individual universities and might not be particularly useful to universities in vastly different classifications or regions.

A recent study of seven universities (Ferrer-Balas et al., 2008) recognized for leadership in sustainability uses an assessment model adapted from Jansen (2003) to assess, not sustainability itself, but progress toward organizational sustainability transformation in three change dimensions, Framework, Level, and Actors (FLA). Framework pertains to changes in culture, institutional structure, and technologies necessary for transformation toward sustainability. Level pertains to the level of change required. Actors pertain to the stakeholders involved in the transformation. Values from one to three are assigned to each of the states of the change dimensions found in the institution and graphically represented in three axes. The study concluded that no single pattern of change dominates the transition at the universities analyzed in the study, but most universities have in common strategic efforts that drive sustainability transformation using varying combinations of change dimensions.

In a project benchmarking the Lüneburg Sustainable University Project against fifteen North American institutions of higher education actively practicing sustainability implementation, Beringer (2007) uses thematic content analysis to analyze award applications submitted by the subject institutions to the Association for the Advancement of Sustainability in Higher Education (AASHE). Through the project, Beringer identified a profile of best practices that typify the subject institutions. Table 3 lists the best

practices identified by Beringer. This author grouped the best practices according to the areas of the the Sustainability Assessment Questionnaire (SAQ) developed by the Association of University Leaders for a Sustainable Future (ULSF).

The Lüneburg study categorized data sub-codes into the six categories rather than best practices. The six categories are Governance and Administration, Curriculum and Student Opportunities, Research and Scholarship, Operations, Community Outreach and Service, and Faculty and Staff Professional Development Opportunities. If these categories are assumed to represent the majority of categories of activities encompassing sustainability within higher education, it is appropriate to note that most activities undertaken in FM fall within the Operations category, even though there is some overlap and interconnections among the categories.

The research question posed in this project then can be stated as: *"How do the activities within an institution's FM practices, a sub-set of the institution's operations, relate to the entirety of sustainability activities in the institution?" Specifically: How do accepted facility performance metrics in higher education correlate with the sustainability position of the institution as a whole? Additionally, are direct or indirect FM sustainability roles more central to organizational sustainability?* In order to further investigate these questions, a discussion of performance metrics in higher education FM follows.

1.2.6 Facility Management Performance in Higher Education

In any organization a multitude of performance metrics might be used to improve and optimize various aspects of the organization's performance. However, only a handful

Table 3: Sustainability best practices – Source: Beringer, 2007

SAQ Category	Best Practices Quoted From Beringer (2007)
Governance and Administration	*Has adopted sustainability as a major guiding principle, championed by senior administration; has a sustainability strategy or approved sustainability policies; has sustainability-related multi-stakeholder committee/s; has dedicated faculty or staff time for campus sustainability, including a campus sustainability office; is a member of professional organizations; conducts regular audits and regularly publishes the results in a sustainability report; dedicates student fees to sustainability; and has received external awards.*
Research and Scholarship	*Has at least one sustainability-related research centre or institute; holds an endowed professor, chair or similar; provides internal grant opportunities for sustainability initiatives; and supports external funding applications for sustainability.*
Curriculum	*Offers undergraduate, graduate and/or doctoral studies in sustainability, including a focus on interdisciplinary project-based learning; infuses sustainability themes in traditional disciplinary education; offers sustainability-related service-learning; provides opportunities for student sustainability research; includes sustainability themes in first-year student orientation; gives students and/or graduates the option of a sustainability pledge; and frames (some of) its sustainability education by the UN DESD.*
Student Opportunities	*Has one or more student environmental/social justice/sustainability groups; a green dorm or sustainable living alternatives in residence/s; and other informal sustainability education which structure and foster a sustainable campus community life-world.*
Operations	*Engages in waste, energy and water management, including resource minimization and recycling; commits to a GHG emissions reduction strategy, including transportation planning; exemplifies green building, design, construction and management; applies ecological principles in land use; commits to ethical procurement, including paper, and investment; and subjects itself to EMS or SMS certification.*
Community Service and Outreach	*Conducts educational outreach; hosts sustainability-related events and conferences; has established university-community partnerships and community projects; and communicates its efforts and achievements via a web site, media and/or campus tours or flyers.*
Faculty and staff Development	*Provides faculty and staff development opportunities regarding sustainability and supports external funding applications.*

of these will reflect changes of organizational performance relative to its strategic goals and objectives. This type of indicator is called a key performance indicator. Bauer (2004) explains the concept as follows:

> *KPIs are quantifiable metrics which reflect the performance of an organization in achieving its goals and objectives. KPIs reflect strategic value drivers rather than just measuring non-critical business activities and processes. KPIs align all levels of an organization (business units, departments and individuals) with clearly defined and cascaded targets and benchmarks to create accountability and track progress. KPIs accelerate seamless and collaborative planning across the organization to ensure that everyone is operating from the same playbook.*

Many times KPIs are used in combination with other management techniques such as Six Sigma, total quality management (TQM), and the balanced scorecard (BSC). There are multiple examples from the literature of the use of the BSC, previously discussed, to develop performance metrics in the facility realm (Brackertz & Kenley, 2002; De Toni, Fornasier, Montagner, & Nonino, 2007; Dilanthi, Richard, Marjan, & David, 2002; Hubbard, 2009; Lai & Yik, 2007). APPA also uses the BSC methodology as a tool to help its members manage their facilities.

APPA is an association of higher education facility professionals from over 1500 institutions in the United States, Canada, and abroad. APPA has conducted a survey of facility performance indicators (FPIS) annually for a number of years. The FPIS consists of critical facility performance data based on the Balanced Scorecard management approach (Kaplan & Norton, 1996), capturing performance areas that are traditionally managed by facility departments of institutions of higher education. The indicators included in the FPIS are a compilation of indicators that has been distilled over several

generations of the survey with input from participants as to which indicators are most critical to indicate the alignment of facility functions with that of the strategic goals and objectives of the institution. This collective agreement upon which key performance indicators are most important for institutions of higher education to track is an important element of performance measurement because, as stated by Bauer (ibid.), “The success of any performance management program is thus contingent on selecting the correct KPIs. Selection of the wrong KPIs can result in counterproductive behavior and suboptimized results”.

Participation in the APPA FPIS allows participants to benchmark performance against other survey participants and to track FPI trends over time as a basis from which to improve FM alignment with organizational strategic goals and to improve performance over time in the focus areas of the Balanced Scorecard: financial, internal business processes, learning and growth, and the customer. The USG chose to participate in the FPIS during the summer of 2009 as a cohort of thirty-five institutions and one non-teaching research institute. APPA classifies survey respondents according to Carnegie classifications of universities developed by the Carnegie Foundation for the Advancement of Teaching. USG member institutions are a diverse community of institutions and are represented in all Carnegie classifications.

The USG chose to use the APPA FPIS rather than developing its own metrics or using alternatives available in the marketplace for several reasons. Obviously, it is much easier to use something already developed. The APPA survey was developed by a not-for-profit association of higher education facility professionals, which lessened the influence of the profit motive to affect the design of the survey, which is consistent with a

not-for-profit public system. Most of the institutions are active members of the Georgia chapter of APPA, GAPPA, and the association is a trusted source of expertise and support for them. In addition, APPA spent years developing, refining, and administering the FPIS. In 2009, over two hundred institutions in addition to the USG across the US and internationally participated in the FPIS, providing a wide and diverse range of participants against which to benchmark. Also integral to the USG decision was the fact that a peer evaluation process was under way to evaluate all the FM departments of the USG. The FPIS would serve as a consistent, standardized, and impartial set of metrics to use as bases of comparisons for the peer evaluation teams. All data could be gathered in the same survey cycle and would be in a standard format for ease of use and consistency among comparisons. Cost was also a key consideration. Participation in the survey is available to APPA members at no additional charge, and most USG institutions were members, making the FPIS a very affordable option. The survey is web-based and administered by APPA, giving easy access to the survey for institutions across the state of Georgia.

1.2.7 The Intersection of Facility Management Performance and Organizational Sustainability

Because the collective activities associated with an organization's facilities in the course of executing the organization's mission have a significant impact on both the sustainability of the organization, that of the economy, society and natural environments in which the those facilities exist, FMs require a better understanding of what sustainability means in terms of the universe of activities embodied in FM. Just as they require means to measure facility performance in terms of the balanced scorecard, it will become increasingly important for FMs to also measure facility sustainability and to

understand how facility performance relates systemically to organizational sustainability. The identification, development, and use of sustainability performance indicators will be critical to FMs' efforts to manage performance in the sustainability arena.

The direct role of FM in organizational sustainability encompasses activities in functional areas such as waste management, operations, maintenance, construction and renovation. Table 4 contains examples of performance areas typically falling under FM and how each performance area might impact sustainability. Sustainability assessment methods are discussed in 1.2.5. All thorough sustainability assessments look at these elements of the FM direct role. Direct role sustainability impacts are more clearly captured in Shriberg's (2004) concept of eco-efficiency assessment, being more incremental in nature rather than pure sustainability assessment, which is both incremental and systemic in nature. This author postulates that the indirect FM sustainability role is more systemic in nature and will be more accurately assessed with methods measuring systemic sustainability. These relationships are identified in Figure3. This author is aware of no other case where the FM sustainability direct and indirect roles are conceptualized.

1.2.8 Additional Burden of Sustainability Leadership in Higher Education

The literature contains many arguments which place special emphasis on the responsibility and expectation for higher education to play a central role in the advancement of sustainability. FMs in higher education must share in this increased expectation if higher education is to rise to the challenge. Hawken, Lovins, and Lovins in their landmark book on the economics of sustainability, *Natural Capitalism (1999),* speak of the impact universities could have on the advancement of sustainability:

Table 4: Aspects of FM performance and potential impacts to organizational sustainability

Sample Facility Metric	Potential Impact Upon Organizational Sustainability
Total Facilities Full Time Equivalent (FTE) Employees	Smaller facilities departments might be inherently more sustainable. Or larger departments might have more resources and flexibility to pursue sustainable practices.
Total Building Gross Square Feet Owned	Larger physical plants might present increased challenges to the organization due to challenges in funding maintenance and capital renewal resources, as well as environmental compliance issues inherent in larger environmental impact generators. Larger carbon footprints. Decreased efficiencies that often accompany huge scales. Decreased efficiencies that often are not present in smaller scales.
Total Buildings Owned	Are virtual educational environments more sustainable than physicals ones? Often institutions are saddled with buildings that outlive their usefulness and are not easily updated, repurposed, demolished, or sold.
Average Age of Mission Critical Buildings	H.E. buildings are often built for useful lives of 50+ years. Updating and modernizing historic buildings is often restricted or impractical.
Total Acres Maintained	Maintenance of acreage is almost always less sustainable than keeping land 'natural'.
Current Replacement Value	Higher replacement values discourage growth and capital replacement, which might or might not contribute to sustainability.
M&O Cost Ratios/Square Foot	Higher efficiencies are generally more sustainable/leaner. Low ratios might indicate decline into disrepair, increasing TCO.
M&O Cost Ratios/Student Full Time Equivalent	Higher efficiencies might mean more access by students. More opportunities to teach and demonstrate sustainability to students.
New Construction S.F./S.F. Existing Space	Too much new construction might not be sustainable and have greater impacts.
Replacement Construction S.F./S.F. Existing Space	Low ratio might indicate more repurposing or better use of existing space.
New Construction S.F./Student F.T.E.	Higher ratio might indicate higher facilities burden for students or higher research function. Research might or might not support sustainability.
Energy Use Intensity (BTUs/S.F.)	Lower numbers while achieving mission are more sustainable.
Energy Cost Intensity (Energy Dollars Spent/S.F.)	Lower numbers while achieving mission are more sustainable.
% Energy from Renewable Energy Sources	Higher numbers are generally more sustainable.
Building's Total Cost of Ownership	Lower numbers while achieving mission are more sustainable.
Current Capital Renewal and Replacement Needs/Annual Capital Investment	Lower numbers are more sustainable.

> *The largest institution addressing mental models is our schools. Colleges, universities, and public schools can change their impact on the environment in two fundamental ways. They create the citizens, MBAs, engineers, and architects that create our world. At the same time they spend $564 billion a year to do so, including $17 billion annually on new construction on colleges and universities. Oberlin Professor David Orr, the leading spokes -person for integrating the environment and education, points out that a large segment of that money is spent to purchase energy, materials, food, and water in ways that are every bit as inefficient as this book outlines. Orr believes that changing the procurement, design, and investments made by our educational systems represents a "hidden curriculum" that can teach, as "powerfully as any overt curriculum, a more comprehensive way of seeing the world that is the foundation for a radically different curriculum than that presently offered virtually anywhere. In every respect this is a challenge of how we think which makes it a challenge for those purporting to improve thinking. Much of the change in outlook and perspective called for will not happen in the time available unless schools, colleges, and education get it"* (p. 315).

The challenge before higher education organizations such as the USG is aligning the sometimes-conflicting realities of public perception, pressures in the political arena, conflicting interests inside universities, and pressures to maintain traditional financial performance with Orr's charge to not only teach sustainability but to take a leadership role in being sustainable by demonstrating sustainability. Corcoran (2004) and others (Pittman, 2004; Shriberg, 2004) concur with Orr that the impact of graduates on global sustainability will probably far outstrip the considerable direct impact represented in the physical assets and operations of universities. Corcoran quotes Cortese (1992) as stating as a moral imperative the obligation of higher education to advance global sustainability through influencing policy development, educating, informing, supporting, reaching out to the community, and through research. Supporting these aspects of higher education certainly fall more under the indirect role of higher education FMs than within the direct role, leading to an assumption that the direct role of FM in higher education will move

the institutional sustainability needle to a lesser degree, possibly a much lesser degree, than will the indirect role of FM. The objectives of this research are to advance the body of knowledge to understand how direct and indirect FM sustainability roles might be aligned to achieve greater sustainability within USG facilities, how sustainability might be measured for use in performance management and reporting, and how increased sustainability within USG facilities relates to that of the USG organizationally.

CHAPTER 2

IDENTIFICATION OF THE RESEARCH PROBLEM & STATEMENT OF THE HYPOTHESIS

For the facility profession, opportunities for research abound and the need is both urgent and voluminous. The need is urgent because many scientists think that we must act quickly to create sustainable societies or risk not surviving as a viable planet. The need is voluminous because, for various reasons, FM as a discipline is maturing later than other disciplines in the academic arena, and the total global investment in built assets is enormous. Rodman and Lessen state that, just in the area of energy, alone, "buildings consume at least 40 percent of the world's energy" (as cited in Mendler, Odell, & Hellmuth, 2000).

Until recent years, many FM practitioners rose from the ranks of trades people who operated facilities. When FM training was available, it was largely based in applied knowledge or experience rather than in formal academic arenas. FMs who possessed formal education typically were architects or professional engineers. Their training centered more on how to design and construct facilities than on how to own, maintain, and operate them. Only relatively recently have academic programs been created that focus primarily on FM as a discrete discipline. Subsequently, relative to other commonly accepted business management disciplines such as Human Resource Management and Risk Management, facility related research has not been represented in proportion to the collective amount of resources invested in facilities globally, or in proportion to the environmental impact that built assets collectively exert. The sustainability movement

has accelerated demand for facility related research to determine how facilities impact the environment and what measures can be taken to lessen those impacts in the areas of facility design, construction, maintenance, operations, demolition and disposal.

FM tools such as the APPA Facilities Performance Indicator Survey, discussed in section 1.2.6, have been developed as management tools for FMs in higher education, emphasizing the need for quantifiable means for process and practice improvements and advancing professionalism within higher education FM. Although it is generally accepted that a strong connection exists between FM and sustainability, little research has been performed to date to identify the strength of that connection.

Several research questions are presented in section 1.2.7. How do the activities within an institution's FM practices, a sub-set of the institution's operations, relate to the entirety of sustainability activities in the institution? Specifically, do accepted facility performance metrics in higher education correlate with the sustainability position of the institution as a whole? The concepts of direct and indirect sustainability roles in FM are introduced to help answer these questions. It is assumed that the direct role of FM impacts organizational sustainability through operational aspects of FM. Since operational aspects of FM can be and are measured through FM performance indicators, it is reasonable to expect a relationship between facility performance indicators in efficiently run facilities and increased sustainability in the organization, and vice versa.

The following analysis explores these questions within the bounds of this research question: Is data collected in the APPA 2007-2008 Facilities Performance Indicator Survey and other facilities performance metrics sources for USG institutions correlated with the organizational sustainability of USG institutions? This research question is

phrased as the following hypothesis: ***Facilities performance indicators collected in the APPA 2007-2008 Facilities Performance Indicator Survey for USG institutions correlate with organizational sustainability of USG institutions as represented by sustainability best practices of the institution.***

CHAPTER 3

METHODOLOGY

3.1 Methodology Overview

An extensive literature review is performed relating to the concept of sustainability, the sustainability of organizations in the private and public sectors, and organizational sustainability in institutions of higher education. Systems theory is explored, particularly as related to the interaction of organizational components that affect an organization's overall sustainability. Barriers to and drivers of sustainability in the organization are researched in the literature. Literature on the role of FM in organizational sustainability is reviewed. Finally, the literature is reviewed for assessment methods for both organizational sustainability and facility performance metrics.

From the literature, the author synthesized a model representing FM impacts on organizational sustainability. The concepts of direct and indirect FM sustainability roles are conceptualized and are represented in the model presented in Figure 3. Relationships are indicated from the literature and are expected between organizational sustainability in higher education institutions for both direct and indirect sustainability roles in FM functions. While there is some overlap, the direct sustainability role of FM is more operational in nature than the indirect role. For example, FMs often work to reduce energy use intensity (BTU/Square Foot). Whether this is done for financial reasons or out of concern for the environment, the result is the same: lower energy use intensity is more

sustainable than higher energy use intensity. In the same way, sustainable building practices are often adopted by the institution out of a desire to decrease total cost of ownership of a facility, which is a financial and operational concern. However, sustainable construction can serve as a connector for sustainability actors throughout the organization. Environmental staff at the college might rally around the practice. Faculty might use the project in coursework to provide a project-based learning experience. Environmentally aware administrators will recognize the project as integral to the institution's sustainability mission and goals. But do sustainable operational practices (direct role) impact organizational sustainability?

FM indicators are used to capture, quantify, and compare the effectiveness of FM practices among FM practitioners. The research methodology in this paper tests the strength of sustainability roles of FM as quantified in various operational aspects of higher education FM metrics and performance indicators for USG institutions against an indicator of organizational sustainability in USG institutions, sustainability best practices.

USG institutions and facilities departments are chosen as the research subject due to the large number (35) of degree-granting institutions in the system and the author's ready access to and familiarity with USG data. Selected existing FM performance metrics data in the form of 2007-2008 APPA FPIS results for USG institutions, USG energy data, and best practices scores generated for this paper using a sustainability rating system developed by the author are statistically analyzed using SPSS.

Because relationships are assumed from the literature as discussed previously, a data table is created using the sustainability scores for all institutions as the dependent variable and 21 APPA FPIS and USG energy performance metrics as independent

variables. A graduate student using the analytical software program SPSS (formerly, Statistical Package for the Social Sciences) performs multiple regression analysis on the data table.

An initial statistical analysis is performed as a correlation study with the intent of determining linear relationships between the best practices scores, FPIS data, and energy consumption measurements. Variables found to have a have a strong relationship with sustainability best practices scores in the correlation study are subsequently treated as independent variables and are used to run a stepwise multiple regression analysis using the best practices scores as the dependent variable in order to determine a model that best describes the relationship between organizational sustainability and FM performance variables. Analyses are performed and conclusions are drawn from the statistical analyses of the data in light of the stated hypothesis (Chapter 2).

3.2 Methodology Detail

Detail is provided in the following sections for methods used in data gathering and data analyses.

3.2.1 Development of Sustainability Ratings as the Dependent Variable

A gage of organizational sustainability for USG institutions is required for the analysis against which to measure impacts of FM metrics. This data did not previously exist. USG institutions as a group do not self-assess for sustainability. Even if they did, the likelihood of standardized assessment outputs is small (Shriberg, 2004). As discussed in 1.2.5, current sustainability assessment methods such as GRI and ISO are time consuming and imposing tasks. The use of existing sustainability assessment methods are prohibited within the scope, time frame, and resources of this paper.

For this analysis, an assessment instrument is designed using sustainability best practices of sustainability leaders in higher education as indentified in Beringer (2007). The best practices are parsed into 38 separate practices and grouped by the author according to categories used in the Sustainability Assessment Questionnaire, an assessment tool administered by University Leaders for a Sustainable Future (ULSF). A scoring sheet is developed with which to score sustainability at each USG institution. See Figure 4 for a sample scoring sheet.

Institution numbers are assigned identifying the institution at the top of the scoring sheet in order to preserve confidentiality. The number assigned to each institution is coordinated with the respective institution number used in the FPIS for ease of comparing data.

Sustainability scoring is accomplished through providing a score of 1 or 0 on the rating sheet for each of 38 sustainability best practices in higher education as identified in Beringer (2007). The web site for each institution is searched for evidence of the use of the best practice at the institution and a judgment is made by the researcher as to whether evidence exists to support awarding the point for the respective best practice. Points are totaled on the scoring form for a maximum of 38 points for each institution. Web site addresses and notes are documented on a second page of the scoring sheet by the line number corresponding to the best practice number for which the point is awarded.

As a control, scoring is reviewed by the Assistant Vice Chancellor with the USG. Sustainability for the USG falls within the job responsibilities of the Assistant Vice

Institution Number: ____			
Group	**Best Practice Adapted From Beringer (2007)**		**Y=1**
Governance & Administration	1	Adopts sustainability as a major guiding principle	
	2	Championed by senior administration	
	3	Strategy or approved sustainability policies	
	4	Sustainability committee	
	5	Dedicated faculty or staff time for campus sustainability	
	6	Campus sustainability office	
	7	Belongs to professional organizations for sustainability	
	8	Conducts regular sustainability audits	
	9	Regularly publishes a sustainability report	
	10	Dedicates student fees to sustainability	
	11	Received external awards for sustainability	
Research & Scholarship	12	At least one sustainability-related research center or institute	
	13	Endowed professor, chair or similar in sustainability	
	14	Internal grant opportunities for sustainability initiatives	
	15	Supports external funding applications for sustainability	
Curriculum	16	Undergraduate, graduate and/or doctoral studies in sustainability, including a focus on interdisciplinary project-based learning	
	17	Infuses sustainability themes in traditional disciplinary education	
	18	Provides sustainability-related service-learning	
	19	Provides opportunities for student sustainability research	
	20	Includes sustainability themes in first-year student orientation	
	21	Gives faculty and/or students the option of a sustainability pledge	
	22	Frames (some of) its sustainability education by the UN DESD	
Student Opportunities	23	Has one or more student environmental/social justice/sustainability groups	
	24	Provides green dorm or sustainable living alternatives in residence/s	
	25	Provides informal sustainability education opportunities which structure and foster a sustainable campus community life-world	
Operations	26	Engages in waste, energy and water management, including resource minimization and recycling	
	27	Commits to a GHG emissions reduction strategy	
	28	Engages in transportation planning	
	29	Exemplifies green building, design, construction and management	
	30	Applies ecological principles in land use	
	31	Commits to ethical procurement, including paper, and investment	
	32	Subjects itself to EMS or SMS certification	
Community Service & Outreach	33	Conducts educational outreach	
	34	Sustainability-related events and conferences	
	35	Established university-community partnerships and community projects	
	36	Communicates its efforts and achievements via a web site, media and/or campus tours or flyers	
Faculty & Staff Development	37	Provides faculty and staff development opportunities regarding sustainability	
	38	Supports external funding applications	
TOTAL SCORE			

Figure 4: Sample Sustainability Best Practices Rating Sheet for USG Institutions

Chancellor. Some adjustments are made as a result of the Assistant Vice Chancellors' review and additional information is provided in the review.

Once sustainability scores are developed and reviewed for all USG institutions, the scores are used as the dependent variable in the experiment representing the current state of organizational sustainability for USG institutions. Completed sustainability scoring sheets are presented in Appendix A. A summary of the scores is provided in Table 5.

Table 5: Sustainability best practices ratings for USG institutions
Note: One non-degree granting research institute is excluded

USG Inst.	Sus. Score	USG Inst.	Sus. Score	USG Inst.	Sus. Score
INST 1	1	**INST 13**	5	**INST 25**	**0**
INST 2	0	**INST 14**	5	**INST 26**	**1**
INST 3	5	**INST 15**	8	**INST 27**	**0**
INST 4	0	**INST 16**	5	**INST 28**	**4**
INST 5	2	**INST 17**	2	**INST 29**	**1**
INST 6	1	**INST 18**	0	**INST 30**	**Excluded**
INST 7	3	**INST 19**	16	**INST 31**	**2**
INST 8	0	**INST 20**	4	**INST 32**	**10**
INST 9	7	**INST 21**	7	**INST 33**	**15**
INST 1	1	**INST 22**	25	**INST 34**	**6**
INST 11	11	**INST 23**	0	**INST 35**	**7**
INST 12	1	**INST 24**	13	**INST 36**	**0**

This assessment methodology assumes a relationship between institutional best practices and organizational sustainability. This relationship has not been tested and is not within the scope of this paper to test. While it is reasonable to expect that organizations recognized for sustainability excellence maintain practices that lead to

organizational sustainability, the concept of systemic organizational sustainability is complex and not easily defined or assessed and it is not known if current activities deemed as best practices will, in fact, lead to organizational sustainability. Even so, this abbreviated assessment methodology is devised to assess higher education organizations for participation in current practices of recognized sustainability leaders in higher education. Time and further research will tell if these practices lead to a state of sustainability in the organizations that use them, or at least lead to the next generation of sustainability best practices.

3.2.2 APPA FPIS and USG Energy Data as Independent Variables

Traditional performance reporting metrics data gathered using the 2007-2008 APPA FPIS for the 36 USG facility departments collected in the summer of 2009 are examined to determine their potential use as data points for correlation with sustainability indicators. The FPIS Express Survey, the version of the survey in which USG institutions participated as a cohort, captures a total of 71 metrics when fully completed. These metrics are then used to perform various ratios and measures which have been determined by APPA, its members, and survey participants as useful in higher education FM performance management and in establishing FM best practices. A report is published annually by APPA with results of the FPIS. In survey year 2007-2008, 225 institutions form the US and abroad participated in the survey in addition to the Georgia cohort of 36 institutions. According to APPA, the FPIS collects data in survey sections related to questions that every facility manager should understand about their respective FM units. The questions are: What facilities make up our institution? Is my institution adequately funding the facilities management annual budget? Are the operating funds

that my facilities department receives being spent in a manner that supports desired outcomes? (Operating Costs and Staffing Ratios). Under business practices: Is my institution making the right investment in our existing buildings, infrastructure, and academic programs? Are the customers satisfied with the space and service? Is my facilities department developing staff that can sustain excellence?

The 71 data points from the FPIS are reduced by the researcher to a sample of 20 metrics for correlation with sustainability best practices. These 20 are chosen for their potential to test the relationships conceptualized in section 1.2.4.2. One additional data point is selected from USG energy data, energy intensity, in the form of BTUs/Square Foot. The 21 data points selected are shown in Table 6.

Table 6: Data points selected for correlation analysis

	Metric	**Data Field**	**Cat.**
1	Student Official FTE Enrollment	Genl_8_25	Size
2	Total Facilities FTE	Genl_1_40_a	FM
3	Building GSF Maintained by Facilities (Converted to GSF)	Bldg_4_35_a	FM
4	Total Acres Maintained (Converted to ACRE)	Grnd_8_38_a	FM
5	Annual Facility Operating Expenditure (Converted to DOL)	Genl_8_87	FM
6	Gross Institutional Expenditures (Converted to DOL)	Genl_8_89	Size
7	Facilities Operating Expenditures per GIE	Genl_R_FacExpGIE	FM
8	Facilities operating Expenditures per GSF	Genl_R_FacExpGSF	FM
9	Energy Total Cost per GSF with Purchased Utilities	Engy_R_Costw_PUGSF	FM
10	Total Cost All Op Functions w/PU per Student	Genl_R_TotdolStuw_PU	FM
11	Construction Cost per Student FTE	Cnst_R_CostStuFTE	FM
12	Constr Cost as Percent Total Operating Costs w/o Purch Utilities	Cnst_R_pctTotalw_oPU	FM
13	Custodial Total Cost per Student FTE	Cust_R_CostStuFTE	FM
14	Custod Cost as Percent Total Operating Costs wo Purch Utilities	Cust_R_pctTotalw_oPU	FM
15	Energy Cost per Student FTE with Purchased Utilities	Engy_R_Costw_PUStuFT	FM
16	Energy Cost as Percent Total Operating Costs without Purch Utilities	Engy_R_pctTotalw_oPU	FM
17	Grounds Total Cost per Student FTE	Grnd_R_CostStuFTE	FM
18	Grounds Cost as Percent Total Operating Costs wo Purch Utilities	Grnd_R_pctTotalw_oPU	FM
19	Maintenance Total Cost per Student FTE	Main_R_CostStuFTE	FM
20	Maint Cost as Percent Total Operating Costs wo Purch Utilities	Main_R_pctTotalw_oPU	FM
21	BTU/SF	BYU/SF	USG

3.2.2.1 Selection of Facilities Performance Indicators for Comparison

Section 1.2.5 notes that FM activities are a subset of operational activities, and operational activities are a subset of a broad range of activities that are considered in sustainability assessment tools like the SAQ to determine sustainability impacts of the organization. FM performance metrics categorize, standardize, and quantify FM data and activities in such a way as to allow management practices and activities to be analyzed and compared across multiple FM departments. In section 1.2.4.2 the concepts of direct and indirect roles of FM in organizational sustainability are introduced and the assumption is presented that these FM roles do indeed impact organizational sustainability. It is reasonable to expect, then, that certain FM performance indicators correlate with organizational sustainability to some degree. Therefore, the intent in choosing indicators for use as independent variables is to select a representative set of FM data and performance metrics that might be used to test for correlation with sustainability best practices in order to help answer the research question as stated in section 2.3, "Is data collected in the APPA 2007-2008 Facilities Performance Indicator Survey and other facilities performance metrics sources for USG institutions correlated with the organizational sustainability of USG institutions?" A discussion of the independent variables chosen for the experiment follows.

FM metrics vary in the information they yield. Some data simply measure the physical and financial characteristics of the facilities and the operation of those facilities with which the FM department is charged, for example, gross square feet of space maintained and total energy consumption. For this paper, these are called base data. Other metrics use the base data in formulae and ratios as measures of FM performance such as

‘maintenance dollars expended annually per square foot of space maintained’ or ‘energy consumption per unit of building measure’. These are commonly called performance metrics or performance indicators. Another type of FM metric identifies more qualitative aspects of FM such as customer and employee satisfaction.

While base data tends to be a function of the size of an institution, performance indicators are not because they are ratios applied to units of the facilities and FM operations for the purpose of standardizing the comparisons. Two FM independent variables are chosen for the experiment that relate to the size of the institution rather than to FM in order to test for linear relationships with the size of the institution. FM base metrics also tend to rise with the scale of the institution and if strong linear relationships are observed between both size and FM base metrics, multicollinearity is a concern. Then, certain performance indicators are selected to test for linear relationships among FM activities under the direct control of FMs and thereby more closely related to the direct role of FM in organizational sustainability. These are included to test for the expected impact of variables more directly within the sphere of influence of the FM, such as energy efficiency of the facilities or numbers of FM workers per unit of space maintained.

From Table 6, metrics 1 and 6, Student Full Time Equivalent Enrollment and Gross Institutional Expenditure, are functions of the size of the institution rather than FM metrics, but are collected in the FPIS. Metrics 1 and 6 are included in the analysis to test for relationships with institutional size. As stated, it is important to test for the size of the institution because metrics 2, 3, 4, and 5 are FM metrics that quantify the scale of the FM operation and also generally increase in proportion to the size of the institution. These

metrics, respectively, are Total Facilities Full Time Equivalent Workers, Building Gross Square Feet Maintained by the FM Department, Total Acres Maintained by the FM Department, and Annual Facility Operating Expenditure in US Dollars. These metrics generally will be larger for larger FM departments and might impact sustainability from dimensions of scale and/or their nature as FM indicators.

Metrics 9, 15 and 21 are energy performance metrics included to test the relationship between energy conservation and sustainability best practices. Metrics 11 and 12 relate to construction at the respective institution and are included to test relationships in terms of construction to sustainability. Metrics 7, 8, 10, 13, 14, 16, 17, 18, 19 and 20 are operational costs per square foot of space maintained or per student full time equivalents. These are FM performance metrics and are less dependent on the size of the FM department. They are included to test for FM-specific metrics versus institutional size: in other words, for impacts of the direct role of FM to sustainability best practices.

All FM metrics with the exception of 1 and 6 in Table 6 represent operational aspects of FM. APPA definitions for metrics 1-20 in Table 6 are given in Appendix B. Metric 21 is from USG energy data collected annually. One non-degree-granting research institute is excluded due to the significant difference in the mission of the institute.

3.2.3 Statistical Methodology Detail

A data table is constructed for the 35 degree granting USG institutions. One non-degree-granting research institute is excluded due to the significant difference in the mission of the institute. Institutions are ordered according to the number given the institution in the APPA FPIS so that data points will align to the respective institution across all variables. Sustainability scores, the dependent variable, are listed for each. As

independent variables, 20 APPA metrics selected in 3.2.2.1 are placed in the table in addition to one energy metric, Energy Use Intensity, obtained from USG energy data. The data table is provided in Appendix C.

In order to assess the strength of the expected correlations between the independent variables and the dependent variable, sustainability best practices scores, a graduate student using the analytical software program SPSS (formerly, Statistical Package for the Social Sciences) performs multiple regression analysis on the data table. The data is treated as if there are no missing data. However, not every cell in the table is filled with data due to the lack of responses from some campuses to the FPIS questions. The numbers of actual responses in each variable are give in the N column and range between 12 and 36.

Pearson correlations are generated for all sets of variables. The SPSS correlation analysis is provided in Appendix D, Table 10, for all variables in the table. Pearson correlations from the SPSS correlation analysis for each of the independent variables in relation to the dependent variable are provided in Appendix E, Table 11, and are further discussed in chapters 4 and 5, and in Appendix G. SPSS descriptive statistics for the 21 variables are presented in Table 7. Seven Pearson correlations are found to be statistically significant. Therefore, it can be inferred that there is a linear relationship between these seven variables and the dependent variable and these seven independent variables are further explored to determine how much variation in the dependent variable might be explained by changes in various combinations, or models, of independent variables, as follows.

Table 7: SPSS Descriptive statistics for 21 variables

	Mean	Std. Deviation	N
Sustaibility_Score	4.6667	5.65180	36
Student_FTE	7462.9412	7707.17520	34
Gross_Institutional_ Expenditure	1.3782E8	2.48847E8	35
FM_FTE_Workers	105.0412	158.20574	34
GSF_Maintained	1.4516E6	1.99976E6	35
Total_Acres_Maintained	216.4378	162.81119	36
FM_Operating_Exp	6.8420E6	9.62251E6	35
Operating_Exp_by_GIE	.0807	.04928	30
Operating_Exp_by_GSF	5.1321	2.39628	34
Energy_Cost_by_SF	2.0343	.73068	34
Oper_Cost_wUtil_by_SF	1322.1065	1054.57626	34
Const_Cost_by_SFTE	118.8639	218.13593	20
Const_Cost_TotalOper Cost	.091074	.1050137	21
Cust_Cost_by_SFTE	118.8639	218.13593	20
Cust_Cost_TotalOper Cost	.091074	.1050137	21
Energy_Cost_by_SFTE	550.7458	666.25710	31
Energy_Cost_by_Total OperCost	.142259	.1648345	12
Grounds_Cost_by_SFTE	113.8111	59.68153	33
Grounds_Cost_by_Total OperCost	.141661	.0675799	35
Maint_Cost_by_SFTE	314.5178	219.44097	32
Maint_Cost_by_TotalOper Cost	.341996	.1179160	34
BTUperSF	107088.00	41733.675	28

SPSS is used to test for explanatory models among the seven independent variables and the dependent variable using stepwise linear regression (Field, 2009), and the findings are presented and discussed in Chapter 4. Analysis is performed and conclusions are drawn from the statistical analysis of the data in light of the assumed FM direct role in organizational sustainability. Conclusions are presented in Chapter 5.

Table 8: Pearson correlations for 7 significantly correlated variables of 21 variables

APPA/USG Metric	APPA/ USG#	Type	SPSS Data Name	Statistic	Value
N/A	**N/A**	DV	Sustainability_Score	Pearson's Correlation Sig. (2-tailed) N	1 36
Building GSF Maintained by Facilities (Converted to GSF)	3	FM Base	GSF_Maintained	Pearson's Correlation Sig. (2-tailed) N	.740** .000 35
Annual Facility Operating Expenditure (Converted to DOL)	5	FM Base	FM_Operating_Exp	Pearson's Correlation Sig. (2-tailed) N	.723** .000 35
Total Facilities FTE	**2**	FM Base	FM_FTE_Workers	Pearson's Correlation Sig. (2-tailed) N	.670** .000 34
Gross Institutional Expenditures (Converted to DOL)	**6**	Size	Gross_Institutional_Expenditure	Pearson's Correlation Sig. (2-tailed) N	.659** .000 35
Student Official FTE Enrollment	**1**	Size	Student_FTE	Pearson's Correlation Sig. (2-tailed) N	.592** .000 34
Total Acres Maintained (Converted to ACRE)	4	FM Base	Total_Acres_Maintained	Pearson's Correlation Sig. (2-tailed) N	.427** .009 36
Grounds Cost as Percent Total Operating Costs wo Purch Utilities	18	Performance Indicator	Grounds_Cost_by_TotalOperCost	Pearson's Correlation Sig. (2-tailed) N	-.362* .033 35

****Correlation is significant at the 0.01 level (2-tailed)**

*** Correlation is significant at the 0.05 level (2-tailed)**

CHAPTER 4

PRESENTATION OF RESEARCH

Presentation of the research begins with a discussion of sustainability best practice scores developed for the analysis as discussed in section 3.2.1. A discussion of the correlation of the sustainability best practice scores with USG FM metrics follows.

4.1 Sustainability Best Practice Scores

Sustainability best practice scores for USG institutions developed for the analysis are admittedly a quick and rough assessment. However, it is precisely these qualities that might make the methodology a useful tool in practice to encourage and assess growth in the best practices which are represented in the assessment. Although analyses of aspects of organizational sustainability other than FM metrics are outside of the scope of the current research, it is prudent to look for obvious patterns in data related to the sustainability best practices scores, especially since the assessment methodology originates with this paper. Some observations are presented in Appendix G.

Two metrics, Organizational Expenditure and Student Full Time Equivalents are included in the independent variables to test for linear relationships strictly for institutional size. It is reasonable to expect an institution's size to impact organizational sustainability. Intuitively, a larger institution would naturally have more resources that might be devoted to sustainability than would a smaller one. Larger faculties, staffs, and student bodies would potentially hold higher numbers of sustainability actors. Especially in a public environment, larger universities have more academic independence to promote sustainability in curricula, in establishing research and outreach centers, and the

like. Large universities typically have larger foundations whereby donations are received to promote programs like sustainability. On the other hand, larger facilities crate increased adverse impacts to the environment. It is noted that the Pearson correlations for the two metrics included to test strictly for institutional size are among the seven statistically significant Pearson scores out of the twenty-one variables chosen for the correlation analysis. More will be said about institutional size in the next section and the influence that institutional size might have on several of the independent variables.

4.2 Correlation of FM Metrics and Sustainability Best Practices

Seven variables significantly correlated with sustainability best practices in USG institutions are found in the Pearson correlations among the 21 independent variables chosen for the analysis. Pearson correlation coefficients, denoted by R, of 1 or -1 reflect a perfect linear correlation between variables. A zero reflects no correlation between the two variables. The Pearson coefficients are given in Appendix E, Table 11, for each of the 21 FM metric chosen as an independent variable for this analysis. The seven variables significantly correlated with sustainability best practices in descending order of Pearson coefficients are ‘gross square feet maintained by the facilities department’ at .740, ‘annual FM operating expenditure’ at .723, ‘number of facilities department employees given in full-time equivalents’ at .670, ‘gross annual institutional expenditure’at .659, ‘student enrollment full-time equivalent’ at .592, ‘total number of acres maintained’ at .427 and ‘grounds costs as a percentage of total FM operating costs’ at -.362. The seven metrics are correlated at a significance level of .05 (Table 8). For example, the correlation between square feet maintained by the facilities department and the sustainable best practices scores is 0.740; therefore, the relationship between these two variables is strong.

Also, R^2 indicates that 54.76% of the variance of sustainability best practices scores is explained by square feet maintained by the facilities department.

As discussed in section 3.2.2.1, different types of indicators are represented in the set of 21 indicators included as independent variables. The types are institutional size metrics, FM base metrics, FM performance metrics, energy metrics, and construction metrics. The types of the significantly correlated variables are given in Table 8.

It might be reasonable to expect the size of an institution to account for most of the impacts to sustainability best practices, either positively or negatively. Larger institutions might have more resources to put toward the pursuit of sustainable practices, thereby increasing them. However, in section 4.1, a pattern is not observed where institution size is strongly related to sustainability best practices when size is measured in terms of money expended or the size of the student body, and these observations are somewhat duplicated here in the statistical analysis. The two size indicators, gross institutional expenditures and student enrollment full-time equivalents are among even significantly related variables, but are fifth and sixth in decreasing rank order among them. The strongest correlations are found between FM base metrics and SBP scores.

The base FM measure of total square feet maintained by the FM department is most strongly correlated with SBP scores. This suggests a stronger relationship between the physical size of an institution and SBPS and than the size of an institution as indicated by the amount of money the institution spends or the size of its student body and SBPS. The next level of analysis, stepwise multiple regression, examines how much of the impact to sustainability best practice scores is explained by the most strongly correlated

variable by itself versus various combinations, or models, of the other significantly correlated variables.

Since, of seven significantly correlate variables, ‘gross square feet maintained’ is found to explain the most impact to sustainability best practices scores, it is used as the basis for a stepwise regression in SPSS in order to explore whether adding the other variables significantly contributes to the model’s ability to explain the dependent variable outcome. SPSS combines variables in stepwise fashion, tests whether the new combination or model significantly increases the ability of the model to explain variance in the dependent variable, and excludes those variables that do not. If new models are found to better explain the variation in the dependent variable, a model is provided in the output and its summary statistics are given. In the stepwise regression performed for this phase of analysis, the six variables other than ‘gross square feet maintained’ are excluded as not significantly contributing to the ability of ‘gross square feet maintained’ to explain the dependent variable. This could be due to a high degree of colliniarity among independent variables, which means that the variables have a high correlation among them and are not distinct from one another, which is one of the assumptions necessary for regression. Regardless, Model 1, consisting of a linear regression between ‘gross square feet maintained’ and ‘sustainability best practices scores’ is the best among the variables at explaining the change in the dependent variable, and will be used for continued analysis. The SPSS output for the stepwise regression is shown in Appendix F. It is noted that ‘gross square feet maintained’ is one of a class of base metrics as previously discussed. Some observations about his relationship are made in Appendix G, Discussion of Research and Findings.

For this regression, Model 1 is found to have a Pearson correlation coefficient, or R, of .751 and is statistically significant. R squared, or .56, gives the percentage of the total variation in sustainability best practices scores that is explained by gross square feet maintained. From the analysis of variance output, the F-score at 36.276 is significant to less than .05, which means that there that this F-score or greater is highly unlikely to occur by chance. The B and t-scores are also found to be significant, which infers an influence between gross square feet maintained and sustainability best practices scores.

Conspicuously missing from variables correlated within the .05 level of significance are FM performance metrics, even though half of the FPIS metrics selected as independent variables in the correlation analysis are performance metrics. The lack of representation of performance metrics among the significantly correlated metrics implies no relationship between the direct sustainability role of FM and sustainability best practices scores.

When it comes to the built environment, possibly no single area of human activity is more strongly associated with sustainability as is energy use. Accordingly, a correlation between energy use in facilities and sustainability best practice scores might be expected, especially since energy conservation easily falls under the umbrella of the direct sustainability role of FM. However, energy metrics are not found to be significantly correlated with sustainability best practices scores. *Since no correlation is found between facilities performance indicators, the hypothesis is proved false.*

CHAPTER 5

CONCLUSIONS

The types of metric most representative of the direct role of FM, operational efficiency FM performance indicators and energy performance indicators, are found not to correlate with sustainability best practices with only one exception, and that one is not very strong. This indicates that the FPIs selected for the analysis reflecting the direct role of FM do not significantly impact overall organizational sustainability, particularly as organizational sustainability is exhibited through the application of recognized sustainability best practices.

While this finding might at first seem contradictory, the finding is easily conceptualized. An institution's physical plant is, by nature, an affront to the environment. The direct sustainability role in FM, at best, minimizes the environmental impacts of the physical plant while meeting the needs of the institution. To completely eliminate the environmental impacts of the physical plant would mean to operate the plant in such a way as to have no impacts or to eliminate the physical plant altogether. Both are ideals likely never to be completely achieved. The achievement of these goals might be possible in some far distant future setting where higher education is achieved in a very different model from that of today. In the near term, zero impact physical plants necessarily will require not only every effort on the part of FMs to operate sustainable plants, but also will require offsets in other areas of organizational sustainability, much as one might purchase carbon offsets. The author believes these "offsets" might be achieved through the indirect role of FM in organizational sustainability, but further research is

needed to validate this hypothesis. The indirect role of FM in organizational sustainability is discussed in Appendix G.

Even though the direct sustainability role of FM is not demonstrated in this research to correlate with sustainability in the organization, intuitively a more sustainably operated facility will undoubtedly have fewer adverse environmental impacts, and environmentally responsible FM practitioners will continue to strive to advance sustainability, especially in activities within their direct control. In addition to these efforts, this research implies that by advocating sustainability and by connecting sustainability advocates in organizations via sustainability projects, events and initiatives, FM practitioners can leverage functional aspects of FM to advance sustainability within their organizations.

5.1 Opportunities for Further Research

Further research is needed to assess whether sustainability best practices lead to a state of increased sustainability in the organizations that use them. Perhaps sustainability best practices can be indentified and cataloged and compared with sustainability assessments, some of which are discussed in section 1.2.5. This future research might be most affectively accomplished by beginning with one institution, or perhaps with a small and a large institution for comparison.

The direct role of sustainability in FM for this study is represented only in existing performance metrics within the industry. Further research might develop performance metrics that better assess the direct sustainability role of FM that might then correlate with sustainability in the organization.

Other characteristics of the research institutions not identified in this study and beyond its scope undoubtedly play roles in the sustainability best practices of the institution, such as a high degree of research per student, urban versus rural settings, or primary academic emphasis. Further research is needed to study these connections.

It could be that stronger models for explaining organizational sustainability might involve both institutional mission and the size of the facility, particularly in the USG. In terms of the size of facilities, research is needed to determine if smaller physical footprints in higher education equate to increased sustainability, and if so, is this true in both public and private universities.

Opportunities exist for further research to identify performance measures and assessment methods for the indirect sustainability role of FM in organizational sustainability and to confirm impacts of the indirect sustainability role with organizational sustainability.

APPENDIX A

AUTHOR'S COMPLETED RATING SHEETS FOR USG INSTITUTIONS

SUSTAINABILITY BEST PRACTICES AS IDENTIFIED IN BERINGER (2007)

Institution Number: 1			
Group	**Best Practice Adapted From Beringer (2007)**		**Y=1**
Governance & Administration	1	Adopts sustainability as a major guiding principle	0
	2	Championed by senior administration	0
	3	Strategy or approved sustainability policies	0
	4	Sustainability committee	0
	5	Dedicated faculty or staff time for campus sustainability	0
	6	Campus sustainability office	0
	7	Belongs to professional organizations for sustainability	0
	8	Conducts regular sustainability audits	0
	9	Regularly publishes a sustainability report	0
	10	Dedicates student fees to sustainability	0
	11	Received external awards for sustainability	0
Research & Scholarship	12	At least one sustainability-related research center or institute	0
	13	Endowed professor, chair or similar in sustainability	0
	14	Internal grant opportunities for sustainability initiatives	0
	15	Supports external funding applications for sustainability	0
Curriculum	16	Undergraduate, graduate and/or doctoral studies in sustainability, including a focus on interdisciplinary project-based learning	1
	17	Infuses sustainability themes in traditional disciplinary education	*
	18	Provides sustainability-related service-learning	0
	19	Provides opportunities for student sustainability research	0
	20	Includes sustainability themes in first-year student orientation	0
	21	Gives faculty and/or students the option of a sustainability pledge	0
	22	Frames (some of) its sustainability education by the UN DESD	0
Student Opportunities	23	Has one or more student environmental/social justice/sustainability groups	0
	24	Provides green dorm or sustainable living alternatives in residence/s	0
	25	Provides informal sustainability education opportunities which structure and foster a sustainable campus community life-world	0
Operations	26	Engages in waste, energy and water management, including resource minimization and recycling	*
	27	Commits to a GHG emissions reduction strategy	0
	28	Engages in transportation planning	0
	29	Exemplifies green building, design, construction and management	0
	30	Applies ecological principles in land use	0
	31	Commits to ethical procurement, including paper, and investment	0
	32	Subjects itself to EMS or SMS certification	0
Community Service & Outreach	33	Conducts educational outreach	0
	34	Sustainability-related events and conferences	0
	35	Established university-community partnerships and community projects	0
	36	Communicates its efforts and achievements via a web site, media and/or campus tours or flyers	0
Faculty & Staff Development	37	Provides faculty and staff development opportunities regarding sustainability	0
	38	Supports external funding applications	0
TOTAL SCORE			1

Source for Each Identified Best Practice by Line Number Institution: Number 1

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3. Link to Policy Manual on website is not active
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16. http://www.valdosta.edu/sra/documents/environ_sci_needs_assessment.pdf Associate of Applied Science in Services, Environmental Horticulture
17. Occasional mention of sustainability themes in various coursework. Search of catalog yields no results for sustainability or sustainable.
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26. Sodexho food services SR practices: http://www.abac.edu/dining/social.html
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Notes:

Actions Taken: Searched website 11-22-09 and 1-23-10
Actions Needed:

Institution Number: 2			
Group	**Best Practice Adapted From Beringer (2007)**		**Y=1**
Governance & Administration	1	Adopts sustainability as a major guiding principle	*
	2	Championed by senior administration	0
	3	Strategy or approved sustainability policies	0
	4	Sustainability committee	0
	5	Dedicated faculty or staff time for campus sustainability	0
	6	Campus sustainability office	0
	7	Belongs to professional organizations for sustainability	0
	8	Conducts regular sustainability audits	0
	9	Regularly publishes a sustainability report	0
	10	Dedicates student fees to sustainability	0
	11	Received external awards for sustainability	0
Research & Scholarship	12	At least one sustainability-related research center or institute	0
	13	Endowed professor, chair or similar in sustainability	0
	14	Internal grant opportunities for sustainability initiatives	0
	15	Supports external funding applications for sustainability	0
Curriculum	16	Undergraduate, graduate and/or doctoral studies in sustainability, including a focus on interdisciplinary project-based learning	0
	17	Infuses sustainability themes in traditional disciplinary education	0
	18	Provides sustainability-related service-learning	0
	19	Provides opportunities for student sustainability research	0
	20	Includes sustainability themes in first-year student orientation	0
	21	Gives faculty and/or students the option of a sustainability pledge	0
	22	Frames (some of) its sustainability education by the UN DESD	0
Student Opportunities	23	Has one or more student environmental/social justice/sustainability groups	0
	24	Provides green dorm or sustainable living alternatives in residence/s	0
	25	Provides informal sustainability education opportunities which structure and foster a sustainable campus community life-world	0
Operations	26	Engages in waste, energy and water management, including resource minimization and recycling	0
	27	Commits to a GHG emissions reduction strategy	0
	28	Engages in transportation planning	0
	29	Exemplifies green building, design, construction and management	0
	30	Applies ecological principles in land use	0
	31	Commits to ethical procurement, including paper, and investment	0
	32	Subjects itself to EMS or SMS certification	0
Community Service & Outreach	33	Conducts educational outreach	0
	34	Sustainability-related events and conferences	0
	35	Established university-community partnerships and community projects	0
	36	Communicates its efforts and achievements via a web site, media and/or campus tours or flyers	0
Faculty & Staff Development	37	Provides faculty and staff development opportunities regarding sustainability	0
	38	Supports external funding applications	0
TOTAL SCORE			0

Source for Each Identified Best Practice by Line Number: Institution Number 2

1. http://asurams.edu/pdf/environmental_policy.pdf
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Actions Taken: Web site search performed 12/5/2009
Actions Needed:

Institution Number: 3			
Group	**Best Practice Adapted From Beringer (2007)**		**Y=1**
Governance & Administration	1	Adopts sustainability as a major guiding principle	0
	2	Championed by senior administration	0
	3	Strategy or approved sustainability policies	0
	4	Sustainability committee	1
	5	Dedicated faculty or staff time for campus sustainability	0
	6	Campus sustainability office	0
	7	Belongs to professional organizations for sustainability	0
	8	Conducts regular sustainability audits	0
	9	Regularly publishes a sustainability report	0
	10	Dedicates student fees to sustainability	0
	11	Received external awards for sustainability	0
Research & Scholarship	12	At least one sustainability-related research center or institute	0
	13	Endowed professor, chair or similar in sustainability	0
	14	Internal grant opportunities for sustainability initiatives	0
	15	Supports external funding applications for sustainability	1
Curriculum	16	Undergraduate, graduate and/or doctoral studies in sustainability, including a focus on interdisciplinary project-based learning	0
	17	Infuses sustainability themes in traditional disciplinary education	0
	18	Provides sustainability-related service-learning	0
	19	Provides opportunities for student sustainability research	0
	20	Includes sustainability themes in first-year student orientation	1
	21	Gives faculty and/or students the option of a sustainability pledge	0
	22	Frames (some of) its sustainability education by the UN DESD	0
Student Opportunities	23	Has one or more student environmental/social justice/sustainability groups	1
	24	Provides green dorm or sustainable living alternatives in residence/s	0
	25	Provides informal sustainability education opportunities which structure and foster a sustainable campus community life-world	0
Operations	26	Engages in waste, energy and water management, including resource minimization and recycling	0
	27	Commits to a GHG emissions reduction strategy	0
	28	Engages in transportation planning	0
	29	Exemplifies green building, design, construction and management	1
	30	Applies ecological principles in land use	0
	31	Commits to ethical procurement, including paper, and investment	0
	32	Subjects itself to EMS or SMS certification	0
Community Service & Outreach	33	Conducts educational outreach	0
	34	Sustainability-related events and conferences	0
	35	Established university-community partnerships and community projects	0
	36	Communicates its efforts and achievements via a web site, media and/or campus tours or flyers	0
Faculty & Staff Development	37	Provides faculty and staff development opportunities regarding sustainability	0
	38	Supports external funding applications	0
TOTAL SCORE			5

Source for Each Identified Best Practice by Line Number: Institution Number 3

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4. http://www.hr.armstrong.edu/sac/pdf/SACminutes10072009.pdf
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15. http://www.armstrong.edu/About/news3/news_aasu_receives_192595_for_green_labs
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20. http://advise.armstrong.edu/flc_6.html
21.
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23. http://www.armstrong.edu/Students/activities_and_orgs/students_sga_goals
24.
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26.
27.
28.
29. http://sa.armstrong.edu/studentunion/goinggreen.html
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Actions Taken: Web site search performed 12/5/2009
Actions Needed:

Institution Number: 4			
Group	**Best Practice Adapted From Beringer (2007)**		**Y=1**
Governance & Administration	1	Adopts sustainability as a major guiding principle	0
	2	Championed by senior administration	0
	3	Strategy or approved sustainability policies	0
	4	Sustainability committee	0
	5	Dedicated faculty or staff time for campus sustainability	0
	6	Campus sustainability office	0
	7	Belongs to professional organizations for sustainability	0
	8	Conducts regular sustainability audits	0
	9	Regularly publishes a sustainability report	0
	10	Dedicates student fees to sustainability	0
	11	Received external awards for sustainability	0
Research & Scholarship	12	At least one sustainability-related research center or institute	0
	13	Endowed professor, chair or similar in sustainability	0
	14	Internal grant opportunities for sustainability initiatives	0
	15	Supports external funding applications for sustainability	0
Curriculum	16	Undergraduate, graduate and/or doctoral studies in sustainability, including a focus on interdisciplinary project-based learning	0
	17	Infuses sustainability themes in traditional disciplinary education	0
	18	Provides sustainability-related service-learning	0
	19	Provides opportunities for student sustainability research	0
	20	Includes sustainability themes in first-year student orientation	0
	21	Gives faculty and/or students the option of a sustainability pledge	0
	22	Frames (some of) its sustainability education by the UN DESD	0
Student Opportunities	23	Has one or more student environmental/social justice/sustainability groups	0
	24	Provides green dorm or sustainable living alternatives in residence/s	0
	25	Provides informal sustainability education opportunities which structure and foster a sustainable campus community life-world	0
Operations	26	Engages in waste, energy and water management, including resource minimization and recycling	0
	27	Commits to a GHG emissions reduction strategy	0
	28	Engages in transportation planning	0
	29	Exemplifies green building, design, construction and management	0
	30	Applies ecological principles in land use	0
	31	Commits to ethical procurement, including paper, and investment	0
	32	Subjects itself to EMS or SMS certification	0
Community Service & Outreach	33	Conducts educational outreach	0
	34	Sustainability-related events and conferences	0
	35	Established university-community partnerships and community projects	0
	36	Communicates its efforts and achievements via a web site, media and/or campus tours or flyers	0
Faculty & Staff Development	37	Provides faculty and staff development opportunities regarding sustainability	0
	38	Supports external funding applications	0
TOTAL SCORE			0

Source for Each Identified Best Practice by Line Number: Institution Number 4

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Actions Taken: Web site search performed 12/5/2009
Actions Needed:

Institution Number: 5			
Group	**Best Practice Adapted From Beringer (2007)**		**Y=1**
Governance & Administration	1	Adopts sustainability as a major guiding principle	0
	2	Championed by senior administration	0
	3	Strategy or approved sustainability policies	0
	4	Sustainability committee	1
	5	Dedicated faculty or staff time for campus sustainability	0
	6	Campus sustainability office	0
	7	Belongs to professional organizations for sustainability	0
	8	Conducts regular sustainability audits	0
	9	Regularly publishes a sustainability report	0
	10	Dedicates student fees to sustainability	0
	11	Received external awards for sustainability	0
Research & Scholarship	12	At least one sustainability-related research center or institute	0
	13	Endowed professor, chair or similar in sustainability	0
	14	Internal grant opportunities for sustainability initiatives	0
	15	Supports external funding applications for sustainability	0
Curriculum	16	Undergraduate, graduate and/or doctoral studies in sustainability, including a focus on interdisciplinary project-based learning	0
	17	Infuses sustainability themes in traditional disciplinary education	0
	18	Provides sustainability-related service-learning	0
	19	Provides opportunities for student sustainability research	0
	20	Includes sustainability themes in first-year student orientation	0
	21	Gives faculty and/or students the option of a sustainability pledge	0
	22	Frames (some of) its sustainability education by the UN DESD	0
Student Opportunities	23	Has one or more student environmental/social justice/sustainability groups	0
	24	Provides green dorm or sustainable living alternatives in residence/s	0
	25	Provides informal sustainability education opportunities which structure and foster a sustainable campus community life-world	0
Operations	26	Engages in waste, energy and water management, including resource minimization and recycling	1
	27	Commits to a GHG emissions reduction strategy	0
	28	Engages in transportation planning	0
	29	Exemplifies green building, design, construction and management	0
	30	Applies ecological principles in land use	0
	31	Commits to ethical procurement, including paper, and investment	0
	32	Subjects itself to EMS or SMS certification	0
Community Service & Outreach	33	Conducts educational outreach	0
	34	Sustainability-related events and conferences	0
	35	Established university-community partnerships and community projects	0
	36	Communicates its efforts and achievements via a web site, media and/or campus tours or flyers	0
Faculty & Staff Development	37	Provides faculty and staff development opportunities regarding sustainability	0
	38	Supports external funding applications	0
TOTAL SCORE			2

Source for Each Identified Best Practice by Line Number: Institution Number 5

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4. http://www.aug.edu/hbusch/Green%20Committee.html
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Actions Taken: Web site search performed on 12/5/2009
Actions Needed:

Institution Number: 6			
Group	**Best Practice Adapted From Beringer (2007)**		**Y=1**
Governance & Administration	1	Adopts sustainability as a major guiding principle	0
	2	Championed by senior administration	0
	3	Strategy or approved sustainability policies	0
	4	Sustainability committee	0
	5	Dedicated faculty or staff time for campus sustainability	0
	6	Campus sustainability office	0
	7	Belongs to professional organizations for sustainability	0
	8	Conducts regular sustainability audits	0
	9	Regularly publishes a sustainability report	0
	10	Dedicates student fees to sustainability	0
	11	Received external awards for sustainability	0
Research & Scholarship	12	At least one sustainability-related research center or institute	0
	13	Endowed professor, chair or similar in sustainability	0
	14	Internal grant opportunities for sustainability initiatives	0
	15	Supports external funding applications for sustainability	0
Curriculum	16	Undergraduate, graduate and/or doctoral studies in sustainability, including a focus on interdisciplinary project-based learning	1
	17	Infuses sustainability themes in traditional disciplinary education	0
	18	Provides sustainability-related service-learning	0
	19	Provides opportunities for student sustainability research	0
	20	Includes sustainability themes in first-year student orientation	0
	21	Gives faculty and/or students the option of a sustainability pledge	0
	22	Frames (some of) its sustainability education by the UN DESD	0
Student Opportunities	23	Has one or more student environmental/social justice/sustainability groups	0
	24	Provides green dorm or sustainable living alternatives in residence/s	0
	25	Provides informal sustainability education opportunities which structure and foster a sustainable campus community life-world	0
Operations	26	Engages in waste, energy and water management, including resource minimization and recycling	0
	27	Commits to a GHG emissions reduction strategy	0
	28	Engages in transportation planning	0
	29	Exemplifies green building, design, construction and management	0
	30	Applies ecological principles in land use	0
	31	Commits to ethical procurement, including paper, and investment	0
	32	Subjects itself to EMS or SMS certification	0
Community Service & Outreach	33	Conducts educational outreach	0
	34	Sustainability-related events and conferences	0
	35	Established university-community partnerships and community projects	0
	36	Communicates its efforts and achievements via a web site, media and/or campus tours or flyers	0
Faculty & Staff Development	37	Provides faculty and staff development opportunities regarding sustainability	0
	38	Supports external funding applications	0
TOTAL SCORE			1

Source for Each Identified Best Practice by Line Number: Institution Number 6

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16. Associate of Applied Science in Technology, Environmental Horticulture
http://www.valdosta.edu/sra/documents/environ_sci_needs_assessment.pdf
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Actions Taken: Web site search performed 12/13/2009
Actions Needed:

Institution Number: 7			
Group	**Best Practice Adapted From Beringer (2007)**		**Y=1**
Governance & Administration	1	Adopts sustainability as a major guiding principle	0
	2	Championed by senior administration	0
	3	Strategy or approved sustainability policies	0
	4	Sustainability committee	0
	5	Dedicated faculty or staff time for campus sustainability	0
	6	Campus sustainability office	0
	7	Belongs to professional organizations for sustainability	0
	8	Conducts regular sustainability audits	0
	9	Regularly publishes a sustainability report	0
	10	Dedicates student fees to sustainability	0
	11	Received external awards for sustainability	0
Research & Scholarship	12	At least one sustainability-related research center or institute	0
	13	Endowed professor, chair or similar in sustainability	0
	14	Internal grant opportunities for sustainability initiatives	0
	15	Supports external funding applications for sustainability	1
Curriculum	16	Undergraduate, graduate and/or doctoral studies in sustainability, including a focus on interdisciplinary project-based learning	0
	17	Infuses sustainability themes in traditional disciplinary education	0
	18	Provides sustainability-related service-learning	0
	19	Provides opportunities for student sustainability research	0
	20	Includes sustainability themes in first-year student orientation	0
	21	Gives faculty and/or students the option of a sustainability pledge	0
	22	Frames (some of) its sustainability education by the UN DESD	0
Student Opportunities	23	Has one or more student environmental/social justice/sustainability groups	1
	24	Provides green dorm or sustainable living alternatives in residence/s	0
	25	Provides informal sustainability education opportunities which structure and foster a sustainable campus community life-world	0
Operations	26	Engages in waste, energy and water management, including resource minimization and recycling	0
	27	Commits to a GHG emissions reduction strategy	0
	28	Engages in transportation planning	1
	29	Exemplifies green building, design, construction and management	0
	30	Applies ecological principles in land use	0
	31	Commits to ethical procurement, including paper, and investment	0
	32	Subjects itself to EMS or SMS certification	0
Community Service & Outreach	33	Conducts educational outreach	0
	34	Sustainability-related events and conferences	0
	35	Established university-community partnerships and community projects	0
	36	Communicates its efforts and achievements via a web site, media and/or campus tours or flyers	0
Faculty & Staff Development	37	Provides faculty and staff development opportunities regarding sustainability	0
	38	Supports external funding applications	0
TOTAL SCORE			3

Source for Each Identified Best Practice by Line Number: Institution Number 7

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15. http://news.clayton.edu/CampusReview/Jan.%2028%202008.pdf
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23. http://a-s.clayton.edu/jboudell/SEEDS/csuseeds.htm
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28. http://adminservices.clayton.edu/ps/rs/ursprograms.html
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Actions Taken: Web-site search preformed 12/13/09
Actions Needed:

Institution Number: 8			
Group	**Best Practice Adapted From Beringer (2007)**		**Y=1**
Governance & Administration	1	Adopts sustainability as a major guiding principle	0
	2	Championed by senior administration	0
	3	Strategy or approved sustainability policies	0
	4	Sustainability committee	0
	5	Dedicated faculty or staff time for campus sustainability	0
	6	Campus sustainability office	0
	7	Belongs to professional organizations for sustainability	0
	8	Conducts regular sustainability audits	0
	9	Regularly publishes a sustainability report	0
	10	Dedicates student fees to sustainability	0
	11	Received external awards for sustainability	0
Research & Scholarship	12	At least one sustainability-related research center or institute	0
	13	Endowed professor, chair or similar in sustainability	0
	14	Internal grant opportunities for sustainability initiatives	0
	15	Supports external funding applications for sustainability	0
Curriculum	16	Undergraduate, graduate and/or doctoral studies in sustainability, including a focus on interdisciplinary project-based learning	0
	17	Infuses sustainability themes in traditional disciplinary education	0
	18	Provides sustainability-related service-learning	0
	19	Provides opportunities for student sustainability research	0
	20	Includes sustainability themes in first-year student orientation	0
	21	Gives faculty and/or students the option of a sustainability pledge	0
	22	Frames (some of) its sustainability education by the UN DESD	0
Student Opportunities	23	Has one or more student environmental/social justice/sustainability groups	0
	24	Provides green dorm or sustainable living alternatives in residence/s	0
	25	Provides informal sustainability education opportunities which structure and foster a sustainable campus community life-world	0
Operations	26	Engages in waste, energy and water management, including resource minimization and recycling	0
	27	Commits to a GHG emissions reduction strategy	0
	28	Engages in transportation planning	0
	29	Exemplifies green building, design, construction and management	0
	30	Applies ecological principles in land use	0
	31	Commits to ethical procurement, including paper, and investment	0
	32	Subjects itself to EMS or SMS certification	0
Community Service & Outreach	33	Conducts educational outreach	0
	34	Sustainability-related events and conferences	0
	35	Established university-community partnerships and community projects	0
	36	Communicates its efforts and achievements via a web site, media and/or campus tours or flyers	0
Faculty & Staff Development	37	Provides faculty and staff development opportunities regarding sustainability	0
	38	Supports external funding applications	0
TOTAL SCORE			0

Source for Each Identified Best Practice by Line Number: Institution Number 8

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Actions Taken: Web-site search performed 12/13/09
Actions Needed:

Institution Number: 9			
Group	**Best Practice Adapted From Beringer (2007)**		**Y=1**
Governance & Administration	1	Adopts sustainability as a major guiding principle	1
	2	Championed by senior administration	0
	3	Strategy or approved sustainability policies	1
	4	Sustainability committee	0
	5	Dedicated faculty or staff time for campus sustainability	0
	6	Campus sustainability office	0
	7	Belongs to professional organizations for sustainability	0
	8	Conducts regular sustainability audits	0
	9	Regularly publishes a sustainability report	0
	10	Dedicates student fees to sustainability	0
	11	Received external awards for sustainability	0
Research & Scholarship	12	At least one sustainability-related research center or institute	0
	13	Endowed professor, chair or similar in sustainability	0
	14	Internal grant opportunities for sustainability initiatives	0
	15	Supports external funding applications for sustainability	0
Curriculum	16	Undergraduate, graduate and/or doctoral studies in sustainability, including a focus on interdisciplinary project-based learning	1
	17	Infuses sustainability themes in traditional disciplinary education	0
	18	Provides sustainability-related service-learning	0
	19	Provides opportunities for student sustainability research	0
	20	Includes sustainability themes in first-year student orientation	0
	21	Gives faculty and/or students the option of a sustainability pledge	0
	22	Frames (some of) its sustainability education by the UN DESD	0
Student Opportunities	23	Has one or more student environmental/social justice/sustainability groups	1
	24	Provides green dorm or sustainable living alternatives in residence/s	0
	25	Provides informal sustainability education opportunities which structure and foster a sustainable campus community life-world	0
Operations	26	Engages in waste, energy and water management, including resource minimization and recycling	1
	27	Commits to a GHG emissions reduction strategy	0
	28	Engages in transportation planning	0
	29	Exemplifies green building, design, construction and management	0
	30	Applies ecological principles in land use	1
	31	Commits to ethical procurement, including paper, and investment	0
	32	Subjects itself to EMS or SMS certification	0
Community Service & Outreach	33	Conducts educational outreach	1
	34	Sustainability-related events and conferences	0
	35	Established university-community partnerships and community projects	0
	36	Communicates its efforts and achievements via a web site, media and/or campus tours or flyers	0
Faculty & Staff Development	37	Provides faculty and staff development opportunities regarding sustainability	0
	38	Supports external funding applications	0
TOTAL SCORE			7

Source for Each Identified Best Practice by Line Number: Institution Number 9

1. http://academics.colstate.edu/catalogs/2007-2008/aboutCSUgoals.htm Goal 8.
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16. Master of Science Environmental Science
    http://www.valdosta.edu/sra/documents/environ_sci_needs_assessment.pdf
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23. http://clubs-orgs.colstate.edu/special_interests.php SSW - Students for a Sustainable World
http://www.colstate.edu/impact/PDF/4_April_IMPACT08.pdf See "Go Green" article
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33. http://oxbow.colstate.edu/34.
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Actions Taken: Web site search performed on 12/27 and 28, 2009
Actions Needed:

Institution Number: 10			
Group	**Best Practice Adapted From Beringer (2007)**		**Y=1**
Governance & Administration	1	Adopts sustainability as a major guiding principle	0
	2	Championed by senior administration	0
	3	Strategy or approved sustainability policies	0
	4	Sustainability committee	0
	5	Dedicated faculty or staff time for campus sustainability	0
	6	Campus sustainability office	0
	7	Belongs to professional organizations for sustainability	0
	8	Conducts regular sustainability audits	0
	9	Regularly publishes a sustainability report	0
	10	Dedicates student fees to sustainability	0
	11	Received external awards for sustainability	0
Research & Scholarship	12	At least one sustainability-related research center or institute	0
	13	Endowed professor, chair or similar in sustainability	0
	14	Internal grant opportunities for sustainability initiatives	0
	15	Supports external funding applications for sustainability	0
Curriculum	16	Undergraduate, graduate and/or doctoral studies in sustainability, including a focus on interdisciplinary project-based learning	0
	17	Infuses sustainability themes in traditional disciplinary education	0
	18	Provides sustainability-related service-learning	0
	19	Provides opportunities for student sustainability research	0
	20	Includes sustainability themes in first-year student orientation	0
	21	Gives faculty and/or students the option of a sustainability pledge	0
	22	Frames (some of) its sustainability education by the UN DESD	0
Student Opportunities	23	Has one or more student environmental/social justice/sustainability groups	1
	24	Provides green dorm or sustainable living alternatives in residence/s	0
	25	Provides informal sustainability education opportunities which structure and foster a sustainable campus community life-world	0
Operations	26	Engages in waste, energy and water management, including resource minimization and recycling	*
	27	Commits to a GHG emissions reduction strategy	0
	28	Engages in transportation planning	0
	29	Exemplifies green building, design, construction and management	0
	30	Applies ecological principles in land use	0
	31	Commits to ethical procurement, including paper, and investment	0
	32	Subjects itself to EMS or SMS certification	0
Community Service & Outreach	33	Conducts educational outreach	0
	34	Sustainability-related events and conferences	0
	35	Established university-community partnerships and community projects	0
	36	Communicates its efforts and achievements via a web site, media and/or campus tours or flyers	0
Faculty & Staff Development	37	Provides faculty and staff development opportunities regarding sustainability	0
	38	Supports external funding applications	0
TOTAL SCORE			1

Source for Each Identified Best Practice by Line Number: Institution Number 10

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23. http://www.daltonstate.edu/studentlife/html/environmental.html
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26. http://www.daltonstate.edu/news_releases/060706_Graduation_List.htm Participates in recycling
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Actions Taken: Web site search performed 12/28/2009
Actions Needed:

Institution Number: 11			
Group	**Best Practice Adapted From Beringer (2007)**		**Y=1**
Governance & Administration	1	Adopts sustainability as a major guiding principle	1
	2	Championed by senior administration	1
	3	Strategy or approved sustainability policies	1
	4	Sustainability committee	1
	5	Dedicated faculty or staff time for campus sustainability	0
	6	Campus sustainability office	0
	7	Belongs to professional organizations for sustainability	0
	8	Conducts regular sustainability audits	0
	9	Regularly publishes a sustainability report	0
	10	Dedicates student fees to sustainability	0
	11	Received external awards for sustainability	1
Research & Scholarship	12	At least one sustainability-related research center or institute	0
	13	Endowed professor, chair or similar in sustainability	0
	14	Internal grant opportunities for sustainability initiatives	0
	15	Supports external funding applications for sustainability	0
Curriculum	16	Undergraduate, graduate and/or doctoral studies in sustainability, including a focus on interdisciplinary project-based learning	1
	17	Infuses sustainability themes in traditional disciplinary education	*
	18	Provides sustainability-related service-learning	0
	19	Provides opportunities for student sustainability research	0
	20	Includes sustainability themes in first-year student orientation	0
	21	Gives faculty and/or students the option of a sustainability pledge	0
	22	Frames (some of) its sustainability education by the UN DESD	0
Student Opportunities	23	Has one or more student environmental/social justice/sustainability groups	1
	24	Provides green dorm or sustainable living alternatives in residence/s	0
	25	Provides informal sustainability education opportunities which structure and foster a sustainable campus community life-world	1
Operations	26	Engages in waste, energy and water management, including resource minimization and recycling	1
	27	Commits to a GHG emissions reduction strategy	0
	28	Engages in transportation planning	0
	29	Exemplifies green building, design, construction and management	0
	30	Applies ecological principles in land use	0
	31	Commits to ethical procurement, including paper, and investment	0
	32	Subjects itself to EMS or SMS certification	0
Community Service & Outreach	33	Conducts educational outreach	1
	34	Sustainability-related events and conferences	0
	35	Established university-community partnerships and community projects	0
	36	Communicates its efforts and achievements via a web site, media and/or campus tours or flyers	1
Faculty & Staff Development	37	Provides faculty and staff development opportunities regarding sustainability	0
	38	Supports external funding applications	0
TOTAL SCORE			11

Source for Each Identified Best Practice by Line Number: Institution Number 11

1. http://www.darton.edu/admin/pub_relations/pdfs/09/UpDate_08-24-09.pdf
2. http://www.darton.edu/admin/pub_relations/pdfs/09/UpDate_08-24-09.pdf
3. http://www.darton.edu/admin/pub_relations/pdfs/09/UpDate_08-24-09.pdf
4. http://www.darton.edu/admin/pub_relations/pdfs/09/UpDate_08-24-09.pdf
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16. Associate of Science Environmental Science
    http://www.valdosta.edu/sra/documents/environ_sci_needs_assessment.pdf
17. http://www.darton.edu/admin/pub_relations/pdfs/09/UpDate_08-24-09.pdf Therefore, during the early part of this academic year I intend to form several sustainability committees – one under the direction of the new VPAA. This committee, in concert with the Deans and faculty, will formulate an across-the-curriculum unit or units that can be taught to all students regardless of major
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Actions Taken: Web site search performed on 12/28/09
Actions Needed:

Institution Number: 12			
Group	**Best Practice Adapted From Beringer (2007)**		**Y=1**
Governance & Administration	1	Adopts sustainability as a major guiding principle	0
	2	Championed by senior administration	0
	3	Strategy or approved sustainability policies	0
	4	Sustainability committee	0
	5	Dedicated faculty or staff time for campus sustainability	0
	6	Campus sustainability office	0
	7	Belongs to professional organizations for sustainability	0
	8	Conducts regular sustainability audits	0
	9	Regularly publishes a sustainability report	0
	10	Dedicates student fees to sustainability	0
	11	Received external awards for sustainability	0
Research & Scholarship	12	At least one sustainability-related research center or institute	0
	13	Endowed professor, chair or similar in sustainability	0
	14	Internal grant opportunities for sustainability initiatives	0
	15	Supports external funding applications for sustainability	0
Curriculum	16	Undergraduate, graduate and/or doctoral studies in sustainability, including a focus on interdisciplinary project-based learning	0
	17	Infuses sustainability themes in traditional disciplinary education	0
	18	Provides sustainability-related service-learning	0
	19	Provides opportunities for student sustainability research	0
	20	Includes sustainability themes in first-year student orientation	0
	21	Gives faculty and/or students the option of a sustainability pledge	0
	22	Frames (some of) its sustainability education by the UN DESD	0
Student Opportunities	23	Has one or more student environmental/social justice/sustainability groups	1
	24	Provides green dorm or sustainable living alternatives in residence/s	0
	25	Provides informal sustainability education opportunities which structure and foster a sustainable campus community life-world	0
Operations	26	Engages in waste, energy and water management, including resource minimization and recycling	*
	27	Commits to a GHG emissions reduction strategy	0
	28	Engages in transportation planning	0
	29	Exemplifies green building, design, construction and management	0
	30	Applies ecological principles in land use	0
	31	Commits to ethical procurement, including paper, and investment	0
	32	Subjects itself to EMS or SMS certification	0
Community Service & Outreach	33	Conducts educational outreach	0
	34	Sustainability-related events and conferences	0
	35	Established university-community partnerships and community projects	0
	36	Communicates its efforts and achievements via a web site, media and/or campus tours or flyers	0
Faculty & Staff Development	37	Provides faculty and staff development opportunities regarding sustainability	0
	38	Supports external funding applications	0
TOTAL SCORE			1

Source for Each Identified Best Practice by Line Number: Institution Number 12

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26. Closes half day on Fridays to conserve energy.
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Actions Taken: Web site searched on 12/29/2009
Actions Needed:

Institution Number: 13			
Group	**Best Practice Adapted From Beringer (2007)**		**Y=1**
Governance & Administration	1	Adopts sustainability as a major guiding principle	0
	2	Championed by senior administration	0
	3	Strategy or approved sustainability policies	0
	4	Sustainability committee	0
	5	Dedicated faculty or staff time for campus sustainability	0
	6	Campus sustainability office	0
	7	Belongs to professional organizations for sustainability	0
	8	Conducts regular sustainability audits	0
	9	Regularly publishes a sustainability report	0
	10	Dedicates student fees to sustainability	0
	11	Received external awards for sustainability	0
Research & Scholarship	12	At least one sustainability-related research center or institute	0
	13	Endowed professor, chair or similar in sustainability	0
	14	Internal grant opportunities for sustainability initiatives	0
	15	Supports external funding applications for sustainability	1
Curriculum	16	Undergraduate, graduate and/or doctoral studies in sustainability, including a focus on interdisciplinary project-based learning	1
	17	Infuses sustainability themes in traditional disciplinary education	0
	18	Provides sustainability-related service-learning	0
	19	Provides opportunities for student sustainability research	1
	20	Includes sustainability themes in first-year student orientation	0
	21	Gives faculty and/or students the option of a sustainability pledge	0
	22	Frames (some of) its sustainability education by the UN DESD	0
Student Opportunities	23	Has one or more student environmental/social justice/sustainability groups	0
	24	Provides green dorm or sustainable living alternatives in residence/s	0
	25	Provides informal sustainability education opportunities which structure and foster a sustainable campus community life-world	0
Operations	26	Engages in waste, energy and water management, including resource minimization and recycling	0
	27	Commits to a GHG emissions reduction strategy	0
	28	Engages in transportation planning	0
	29	Exemplifies green building, design, construction and management	0
	30	Applies ecological principles in land use	0
	31	Commits to ethical procurement, including paper, and investment	0
	32	Subjects itself to EMS or SMS certification	0
Community Service & Outreach	33	Conducts educational outreach	1
	34	Sustainability-related events and conferences	1
	35	Established university-community partnerships and community projects	0
	36	Communicates its efforts and achievements via a web site, media and/or campus tours or flyers	0
Faculty & Staff Development	37	Provides faculty and staff development opportunities regarding sustainability	0
	38	Supports external funding applications	0
TOTAL SCORE			5

Source for Each Identified Best Practice by Line Number: Institution Number 13

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15. http://www.fvsu.edu/about-fvsu/external-affairs/sponsored-programs
16. Master of Public Health, Environmental Health
    http://www.valdosta.edu/sra/documents/environ_sci_needs_assessment.pdf
17.
18.
19. http://www.fvsu.edu/news/fvsu-shines-national-research-conference
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32.
33. http://www.fvsu.edu/about-fvsu/external-affairs/sponsored-programs
34. http://www.fvsu.edu/news/summit-addresses-issues-facing-farmers
35.
36.
37.
38.

Actions Taken: Web search performed on 12/29/2009
Actions Needed:

Institution Number: 14			
Group	**Best Practice Adapted From Beringer (2007)**		**Y=1**
Governance & Administration	1	Adopts sustainability as a major guiding principle	0
	2	Championed by senior administration	1
	3	Strategy or approved sustainability policies	1
	4	Sustainability committee	0
	5	Dedicated faculty or staff time for campus sustainability	0
	6	Campus sustainability office	0
	7	Belongs to professional organizations for sustainability	0
	8	Conducts regular sustainability audits	0
	9	Regularly publishes a sustainability report	0
	10	Dedicates student fees to sustainability	0
	11	Received external awards for sustainability	0
Research & Scholarship	12	At least one sustainability-related research center or institute	0
	13	Endowed professor, chair or similar in sustainability	0
	14	Internal grant opportunities for sustainability initiatives	0
	15	Supports external funding applications for sustainability	0
Curriculum	16	Undergraduate, graduate and/or doctoral studies in sustainability, including a focus on interdisciplinary project-based learning	1
	17	Infuses sustainability themes in traditional disciplinary education	0
	18	Provides sustainability-related service-learning	0
	19	Provides opportunities for student sustainability research	0
	20	Includes sustainability themes in first-year student orientation	0
	21	Gives faculty and/or students the option of a sustainability pledge	0
	22	Frames (some of) its sustainability education by the UN DESD	0
Student Opportunities	23	Has one or more student environmental/social justice/sustainability groups	1
	24	Provides green dorm or sustainable living alternatives in residence/s	0
	25	Provides informal sustainability education opportunities which structure and foster a sustainable campus community life-world	0
Operations	26	Engages in waste, energy and water management, including resource minimization and recycling	0
	27	Commits to a GHG emissions reduction strategy	1
	28	Engages in transportation planning	0
	29	Exemplifies green building, design, construction and management	0
	30	Applies ecological principles in land use	0
	31	Commits to ethical procurement, including paper, and investment	0
	32	Subjects itself to EMS or SMS certification	0
Community Service & Outreach	33	Conducts educational outreach	0
	34	Sustainability-related events and conferences	0
	35	Established university-community partnerships and community projects	0
	36	Communicates its efforts and achievements via a web site, media and/or campus tours or flyers	0
Faculty & Staff Development	37	Provides faculty and staff development opportunities regarding sustainability	0
	38	Supports external funding applications	0
TOTAL SCORE			5

Source for Each Identified Best Practice by Line Number: Institution Number 14

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2. Signed the President's Climate Commitment
3. Signed the President's Climate Commitment
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16. http://www.gsc.edu/academics/iesa/bs/estudies/pages/default.aspx B.S. in Environmental Studies. Certificate of Less than One Year, Environmental Science, Certificate of Less than One Year, Environmental Studies.
17.
18.
19.
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21.
22.
23. http://www.gsc.edu/campuslife/clubsorgs/Lists/ClubsOrgs/DispForm.aspx?ID=42&Source= http%3A%2F%2Fwww%2Egsc%2Eedu%2Fcampuslife%2Fclubsorgs%2FPages%2Fdefault%2Easpx
24.
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27. Signed the President's Climate Commitment
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Actions Taken: Web site searched on12/29/2009
Actions Needed:

Institution Number: 15			
Group	**Best Practice Adapted From Beringer (2007)**		**Y=1**
Governance & Administration	1	Adopts sustainability as a major guiding principle	0
	2	Championed by senior administration	1
	3	Strategy or approved sustainability policies	0
	4	Sustainability committee	1
	5	Dedicated faculty or staff time for campus sustainability	0
	6	Campus sustainability office	0
	7	Belongs to professional organizations for sustainability	0
	8	Conducts regular sustainability audits	0
	9	Regularly publishes a sustainability report	0
	10	Dedicates student fees to sustainability	0
	11	Received external awards for sustainability	0
Research & Scholarship	12	At least one sustainability-related research center or institute	0
	13	Endowed professor, chair or similar in sustainability	0
	14	Internal grant opportunities for sustainability initiatives	0
	15	Supports external funding applications for sustainability	0
Curriculum	16	Undergraduate, graduate and/or doctoral studies in sustainability, including a focus on interdisciplinary project-based learning	1
	17	Infuses sustainability themes in traditional disciplinary education	0
	18	Provides sustainability-related service-learning	0
	19	Provides opportunities for student sustainability research	0
	20	Includes sustainability themes in first-year student orientation	0
	21	Gives faculty and/or students the option of a sustainability pledge	0
	22	Frames (some of) its sustainability education by the UN DESD	0
Student Opportunities	23	Has one or more student environmental/social justice/sustainability groups	1
	24	Provides green dorm or sustainable living alternatives in residence/s	0
	25	Provides informal sustainability education opportunities which structure and foster a sustainable campus community life-world	0
Operations	26	Engages in waste, energy and water management, including resource minimization and recycling	0
	27	Commits to a GHG emissions reduction strategy	0
	28	Engages in transportation planning	0
	29	Exemplifies green building, design, construction and management	0
	30	Applies ecological principles in land use	0
	31	Commits to ethical procurement, including paper, and investment	0
	32	Subjects itself to EMS or SMS certification	0
Community Service & Outreach	33	Conducts educational outreach	1
	34	Sustainability-related events and conferences	1
	35	Established university-community partnerships and community projects	1
	36	Communicates its efforts and achievements via a web site, media and/or campus tours or flyers	1
Faculty & Staff Development	37	Provides faculty and staff development opportunities regarding sustainability	0
	38	Supports external funding applications	0
TOTAL SCORE			8

Source for Each Identified Best Practice by Line Number: Institution Number 15

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16. Bachelor of Science Environmental Science
    http://www.valdosta.edu/sra/documents/environ_sci_needs_assessment.pdf
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22.
23. http://www2.gcsu.edu/orgs/student/esc/
24.
25.
26. http://www2.gcsu.edu/green/energy.html
27.
28.
29.
30.
31.
32.
33. http://www.gcsu.edu/academicoutreach/index.htm
34. http://www2.gcsu.edu/green/education.html
35. http://www2.gcsu.edu/green/education.html
36. http://www2.gcsu.edu/green/index.html
37.
38.

Actions Taken: Web site search performed on 12/29/2009
Actions Needed:

Institution Number: 16			
Group	**Best Practice Adapted From Beringer (2007)**		**Y=1**
Governance & Administration	1	Adopts sustainability as a major guiding principle	0
	2	Championed by senior administration	0
	3	Strategy or approved sustainability policies	0
	4	Sustainability committee	0
	5	Dedicated faculty or staff time for campus sustainability	0
	6	Campus sustainability office	0
	7	Belongs to professional organizations for sustainability	0
	8	Conducts regular sustainability audits	0
	9	Regularly publishes a sustainability report	0
	10	Dedicates student fees to sustainability	0
	11	Received external awards for sustainability	0
Research & Scholarship	12	At least one sustainability-related research center or institute	0
	13	Endowed professor, chair or similar in sustainability	0
	14	Internal grant opportunities for sustainability initiatives	0
	15	Supports external funding applications for sustainability	0
Curriculum	16	Undergraduate, graduate and/or doctoral studies in sustainability, including a focus on interdisciplinary project-based learning	0
	17	Infuses sustainability themes in traditional disciplinary education	0
	18	Provides sustainability-related service-learning	0
	19	Provides opportunities for student sustainability research	0
	20	Includes sustainability themes in first-year student orientation	0
	21	Gives faculty and/or students the option of a sustainability pledge	0
	22	Frames (some of) its sustainability education by the UN DESD	0
Student Opportunities	23	Has one or more student environmental/social justice/sustainability groups	1
	24	Provides green dorm or sustainable living alternatives in residence/s	0
	25	Provides informal sustainability education opportunities which structure and foster a sustainable campus community life-world	0
Operations	26	Engages in waste, energy and water management, including resource minimization and recycling	1
	27	Commits to a GHG emissions reduction strategy	0
	28	Engages in transportation planning	0
	29	Exemplifies green building, design, construction and management	1
	30	Applies ecological principles in land use	1
	31	Commits to ethical procurement, including paper, and investment	1
	32	Subjects itself to EMS or SMS certification	0
Community Service & Outreach	33	Conducts educational outreach	0
	34	Sustainability-related events and conferences	0
	35	Established university-community partnerships and community projects	0
	36	Communicates its efforts and achievements via a web site, media and/or campus tours or flyers	0
Faculty & Staff Development	37	Provides faculty and staff development opportunities regarding sustainability	0
	38	Supports external funding applications	0
TOTAL SCORE			5

Source for Each Identified Best Practice by Line Number: Institution Number 16

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23. http://www.ggc.usg.edu/ggc-life/student-activities/student-clubs-and-organizations
24.
25.
26. http://www.ggc.usg.edu/component/content/article/85-news/526-ggc-is-going-greener recycling
27.
28.
29. http://www.ggc.usg.edu/library
30. http://www.ggc.usg.edu/component/content/article/85-news/526-ggc-is-going-greener land use
31. http://www.ggc.usg.edu/component/content/article/85-news/526-ggc-is-going-greener procurement, Sodexho
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Actions Taken: Web search performed on 12/29/2009
Actions Needed:

Institution Number: 17			
Group	**Best Practice Adapted From Beringer (2007)**		**Y=1**
Governance & Administration	1	Adopts sustainability as a major guiding principle	0
	2	Championed by senior administration	0
	3	Strategy or approved sustainability policies	0
	4	Sustainability committee	0
	5	Dedicated faculty or staff time for campus sustainability	0
	6	Campus sustainability office	0
	7	Belongs to professional organizations for sustainability	0
	8	Conducts regular sustainability audits	0
	9	Regularly publishes a sustainability report	0
	10	Dedicates student fees to sustainability	0
	11	Received external awards for sustainability	0
Research & Scholarship	12	At least one sustainability-related research center or institute	0
	13	Endowed professor, chair or similar in sustainability	0
	14	Internal grant opportunities for sustainability initiatives	0
	15	Supports external funding applications for sustainability	0
Curriculum	16	Undergraduate, graduate and/or doctoral studies in sustainability, including a focus on interdisciplinary project-based learning	1
	17	Infuses sustainability themes in traditional disciplinary education	0
	18	Provides sustainability-related service-learning	0
	19	Provides opportunities for student sustainability research	0
	20	Includes sustainability themes in first-year student orientation	0
	21	Gives faculty and/or students the option of a sustainability pledge	0
	22	Frames (some of) its sustainability education by the UN DESD	0
Student Opportunities	23	Has one or more student environmental/social justice/sustainability groups	1
	24	Provides green dorm or sustainable living alternatives in residence/s	0
	25	Provides informal sustainability education opportunities which structure and foster a sustainable campus community life-world	0
Operations	26	Engages in waste, energy and water management, including resource minimization and recycling	0
	27	Commits to a GHG emissions reduction strategy	0
	28	Engages in transportation planning	0
	29	Exemplifies green building, design, construction and management	0
	30	Applies ecological principles in land use	0
	31	Commits to ethical procurement, including paper, and investment	0
	32	Subjects itself to EMS or SMS certification	0
Community Service & Outreach	33	Conducts educational outreach	0
	34	Sustainability-related events and conferences	0
	35	Established university-community partnerships and community projects	0
	36	Communicates its efforts and achievements via a web site, media and/or campus tours or flyers	0
Faculty & Staff Development	37	Provides faculty and staff development opportunities regarding sustainability	0
	38	Supports external funding applications	0
TOTAL SCORE			2

Source for Each Identified Best Practice by Line Number: Institution Number 17

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16. Associate of Applied Science in Services, Environmental Horticulture
    http://www.valdosta.edu/sra/documents/environ_sci_needs_assessment.pdf
17.
18.
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20.
21.
22.
23. http://www.highlands.edu/sixmilepost/Archives/PDF_Archives/Oct_Archive_2008.pdf
24.
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Actions Taken: Web site search performed on 12/29/2009
Actions Needed:

Institution Number: 18			
Group	**Best Practice Adapted From Beringer (2007)**		**Y=1**
Governance & Administration	1	Adopts sustainability as a major guiding principle	0
	2	Championed by senior administration	0
	3	Strategy or approved sustainability policies	0
	4	Sustainability committee	0
	5	Dedicated faculty or staff time for campus sustainability	0
	6	Campus sustainability office	0
	7	Belongs to professional organizations for sustainability	0
	8	Conducts regular sustainability audits	0
	9	Regularly publishes a sustainability report	0
	10	Dedicates student fees to sustainability	0
	11	Received external awards for sustainability	0
Research & Scholarship	12	At least one sustainability-related research center or institute	0
	13	Endowed professor, chair or similar in sustainability	0
	14	Internal grant opportunities for sustainability initiatives	0
	15	Supports external funding applications for sustainability	0
Curriculum	16	Undergraduate, graduate and/or doctoral studies in sustainability, including a focus on interdisciplinary project-based learning	0
	17	Infuses sustainability themes in traditional disciplinary education	0
	18	Provides sustainability-related service-learning	0
	19	Provides opportunities for student sustainability research	0
	20	Includes sustainability themes in first-year student orientation	0
	21	Gives faculty and/or students the option of a sustainability pledge	0
	22	Frames (some of) its sustainability education by the UN DESD	0
Student Opportunities	23	Has one or more student environmental/social justice/sustainability groups	0
	24	Provides green dorm or sustainable living alternatives in residence/s	0
	25	Provides informal sustainability education opportunities which structure and foster a sustainable campus community life-world	0
Operations	26	Engages in waste, energy and water management, including resource minimization and recycling	0
	27	Commits to a GHG emissions reduction strategy	0
	28	Engages in transportation planning	0
	29	Exemplifies green building, design, construction and management	0
	30	Applies ecological principles in land use	0
	31	Commits to ethical procurement, including paper, and investment	0
	32	Subjects itself to EMS or SMS certification	0
Community Service & Outreach	33	Conducts educational outreach	0
	34	Sustainability-related events and conferences	0
	35	Established university-community partnerships and community projects	0
	36	Communicates its efforts and achievements via a web site, media and/or campus tours or flyers	0
Faculty & Staff Development	37	Provides faculty and staff development opportunities regarding sustainability	0
	38	Supports external funding applications	0
TOTAL SCORE			0

Source for Each Identified Best Practice by Line Number: Institution Number 18

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Actions Taken: Web site search performed on 12/30/2009
Actions Needed:

Institution Number: 19			
Group	**Best Practice Adapted From Beringer (2007)**		**Y=1**
Governance & Administration	1	Adopts sustainability as a major guiding principle	0
	2	Championed by senior administration	1
	3	Strategy or approved sustainability policies	1
	4	Sustainability committee	*
	5	Dedicated faculty or staff time for campus sustainability	0
	6	Campus sustainability office	1
	7	Belongs to professional organizations for sustainability	1
	8	Conducts regular sustainability audits	0
	9	Regularly publishes a sustainability report	0
	10	Dedicates student fees to sustainability	0
	11	Received external awards for sustainability	0
Research & Scholarship	12	At least one sustainability-related research center or institute	1
	13	Endowed professor, chair or similar in sustainability	1
	14	Internal grant opportunities for sustainability initiatives	1
	15	Supports external funding applications for sustainability	1
Curriculum	16	Undergraduate, graduate and/or doctoral studies in sustainability, including a focus on interdisciplinary project-based learning	0
	17	Infuses sustainability themes in traditional disciplinary education	0
	18	Provides sustainability-related service-learning	0
	19	Provides opportunities for student sustainability research	1
	20	Includes sustainability themes in first-year student orientation	0
	21	Gives faculty and/or students the option of a sustainability pledge	0
	22	Frames (some of) its sustainability education by the UN DESD	0
Student Opportunities	23	Has one or more student environmental/social justice/sustainability groups	1
	24	Provides green dorm or sustainable living alternatives in residence/s	0
	25	Provides informal sustainability education opportunities which structure and foster a sustainable campus community life-world	0
Operations	26	Engages in waste, energy and water management, including resource minimization and recycling	1
	27	Commits to a GHG emissions reduction strategy	1
	28	Engages in transportation planning	0
	29	Exemplifies green building, design, construction and management	1
	30	Applies ecological principles in land use	0
	31	Commits to ethical procurement, including paper, and investment	0
	32	Subjects itself to EMS or SMS certification	0
Community Service & Outreach	33	Conducts educational outreach	0
	34	Sustainability-related events and conferences	1
	35	Established university-community partnerships and community projects	1
	36	Communicates its efforts and achievements via a web site, media and/or campus tours or flyers	1
Faculty & Staff Development	37	Provides faculty and staff development opportunities regarding sustainability	0
	38	Supports external funding applications	0
TOTAL SCORE			16

Source for Each Identified Best Practice by Line Number: Institution Number 19

1.
2. President Grube signed the President's Climate Initiative agreement
3. http://services.georgiasouthern.edu/osra/councils/spc/stratplan.pdf See strategic objectives.
4. Student Life and COST have separate committees to perform specific functions, but found no overarching committee for the institution
6. http://calendar.georgiasouthern.edu/?c=38&o=popularity&uc=46
7. http://www.aashe.org/membership/members/institutional_members AASHE
12. http://cost.georgiasouthern.edu/sustainability/index.html
13. http://cost.georgiasouthern.edu/Newsletter_August08.pdf Chair for Renewal Energy
14. http://cost.georgiasouthern.edu/sustainability/Sustainability_grant2009_121009.pdf http://cost.georgiasouthern.edu/Newsletter_August08.pdf Endowed Chair of Renewable Energy
15. cost.georgiasouthern.edu/sustainability/Sustainability_grant2009_121009.docx
19. http://cost.georgiasouthern.edu/news/
23. http://services.georgiasouthern.edu/ess/environmental/studentorgs.html http://www.stp.georgiasouthern.edu/index.php?option=com_content&view=article&id=1394%3Anew-campus-recycling-program-to-begin-in-2010&catid=1%3Alocal-news&Itemid=53 Recycling. Electric metering project to meter all campus buildings.
27. President Grube signed the President's Climate Initiative agreement
29. https://my.georgiasouthern.edu/index.php?option=com_content&view=article&id=247:rac-leed-certification-ceremony
34. http://www.georgiasouthern.edu/strategic/index.php?s=246 http://cost.georgiasouthern.edu/sustainability/CenterForSustainabilityfall2009schedule.pdf http://services.georgiasouthern.edu/ess/environmental/calendar.html
35. http://news.georgiasouthern.edu/viewArticle.php?id=1711
36. http://services.georgiasouthern.edu/ess/environmental/envsust.html

Actions Taken: Web site search performed on 12/31/2009 and 1/2/1010
Actions Needed:

Institution Number: 20			
Group	**Best Practice Adapted From Beringer (2007)**		**Y=1**
Governance & Administration	1	Adopts sustainability as a major guiding principle	0
	2	Championed by senior administration	*
	3	Strategy or approved sustainability policies	0
	4	Sustainability committee	*
	5	Dedicated faculty or staff time for campus sustainability	0
	6	Campus sustainability office	0
	7	Belongs to professional organizations for sustainability	0
	8	Conducts regular sustainability audits	0
	9	Regularly publishes a sustainability report	*
	10	Dedicates student fees to sustainability	0
	11	Received external awards for sustainability	0
Research & Scholarship	12	At least one sustainability-related research center or institute	0
	13	Endowed professor, chair or similar in sustainability	0
	14	Internal grant opportunities for sustainability initiatives	0
	15	Supports external funding applications for sustainability	0
Curriculum	16	Undergraduate, graduate and/or doctoral studies in sustainability, including a focus on interdisciplinary project-based learning	1
	17	Infuses sustainability themes in traditional disciplinary education	0
	18	Provides sustainability-related service-learning	0
	19	Provides opportunities for student sustainability research	0
	20	Includes sustainability themes in first-year student orientation	0
	21	Gives faculty and/or students the option of a sustainability pledge	0
	22	Frames (some of) its sustainability education by the UN DESD	0
Student Opportunities	23	Has one or more student environmental/social justice/sustainability groups	0
	24	Provides green dorm or sustainable living alternatives in residence/s	0
	25	Provides informal sustainability education opportunities which structure and foster a sustainable campus community life-world	0
Operations	26	Engages in waste, energy and water management, including resource minimization and recycling	1
	27	Commits to a GHG emissions reduction strategy	0
	28	Engages in transportation planning	0
	29	Exemplifies green building, design, construction and management	0
	30	Applies ecological principles in land use	0
	31	Commits to ethical procurement, including paper, and investment	0
	32	Subjects itself to EMS or SMS certification	0
Community Service & Outreach	33	Conducts educational outreach	0
	34	Sustainability-related events and conferences	1
	35	Established university-community partnerships and community projects	0
	36	Communicates its efforts and achievements via a web site, media and/or campus tours or flyers	1
Faculty & Staff Development	37	Provides faculty and staff development opportunities regarding sustainability	0
	38	Supports external funding applications	0
TOTAL SCORE			4

Source for Each Identified Best Practice by Line Number: Institution Number 20

1.
2. Strong sustainability efforts were initiated by former president (Green Campus Initiative, P2AD partnership, sustainability audit), but appear not to be aggressively pursued by current administration. Note that Green Campus Initiative web page last updated on 9/6/2005.
3.
4.
5.
6.
7.
8.
9. http://www.gsw.edu/~geology/greencampus/environaudit.htm Campus environmental audit performed 2004-2005
10.
11.
12.
13.
14.
15.
16. Bachelor of Science in Geology, Earth and Environmental Science Education
http://www.valdosta.edu/sra/documents/environ_sci_needs_assessment.pdf
17.
18.
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21.
22.
23.
24.
25.
26. http://www.gsw.edu/~geology/greencampus/p2ad.htm
27.
28.
29.
30.
31.
32.
33.
34. USG begins sustainability initiative, first meeting held at GSW
http://www.gsw.edu/news/index.html
35.
36. http://www.gsw.edu/~geology/greencampus/p2ad.htm
http://www.gsw.edu/~geology/greencampus/greencampus.htm
37.
38.

Actions Taken: Web site search performed 1/4/2010.
Actions Needed:

Institution Number: 21			
Group	**Best Practice Adapted From Beringer (2007)**		**Y=1**
Governance & Administration	1	Adopts sustainability as a major guiding principle	0
	2	Championed by senior administration	0
	3	Strategy or approved sustainability policies	1
	4	Sustainability committee	1
	5	Dedicated faculty or staff time for campus sustainability	0
	6	Campus sustainability office	0
	7	Belongs to professional organizations for sustainability	1
	8	Conducts regular sustainability audits	0
	9	Regularly publishes a sustainability report	0
	10	Dedicates student fees to sustainability	0
	11	Received external awards for sustainability	0
Research & Scholarship	12	At least one sustainability-related research center or institute	0
	13	Endowed professor, chair or similar in sustainability	0
	14	Internal grant opportunities for sustainability initiatives	0
	15	Supports external funding applications for sustainability	0
Curriculum	16	Undergraduate, graduate and/or doctoral studies in sustainability, including a focus on interdisciplinary project-based learning	0
	17	Infuses sustainability themes in traditional disciplinary education	0
	18	Provides sustainability-related service-learning	0
	19	Provides opportunities for student sustainability research	0
	20	Includes sustainability themes in first-year student orientation	0
	21	Gives faculty and/or students the option of a sustainability pledge	0
	22	Frames (some of) its sustainability education by the UN DESD	0
Student Opportunities	23	Has one or more student environmental/social justice/sustainability groups	1
	24	Provides green dorm or sustainable living alternatives in residence/s	0
	25	Provides informal sustainability education opportunities which structure and foster a sustainable campus community life-world	0
Operations	26	Engages in waste, energy and water management, including resource minimization and recycling	1
	27	Commits to a GHG emissions reduction strategy	0
	28	Engages in transportation planning	1
	29	Exemplifies green building, design, construction and management	0
	30	Applies ecological principles in land use	0
	31	Commits to ethical procurement, including paper, and investment	0
	32	Subjects itself to EMS or SMS certification	0
Community Service & Outreach	33	Conducts educational outreach	0
	34	Sustainability-related events and conferences	0
	35	Established university-community partnerships and community projects	0
	36	Communicates its efforts and achievements via a web site, media and/or campus tours or flyers	1
Faculty & Staff Development	37	Provides faculty and staff development opportunities regarding sustainability	0
	38	Supports external funding applications	0
TOTAL SCORE			7

Source for Each Identified Best Practice by Line Number: Institution Number 21

1.
2.
3. http://www.gsu.edu/images/Downloadables/Action_Plan_2009.pdf
4. http://www.gsu.edu/staffcouncil/33176.html
5.
6.
7. http://www.gsu.edu/images/Downloadables/Action_Plan_2009.pdf AASHE
8.
9.
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21.
22.
23. Sustainable Energy Tribe
24.
25.
26. The Building Services department has expanded recycling services this year to include collection of plastic containers, along with paper, aluminum cans, and other materials. Full time energy manager. Extensive metering program. Lowest energy use intensity among USG research institutions.
27.
28.
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35.
36. http://www.cas.gsu.edu/docs/staff/recycling_faq.pdf
37.
38.

Actions Taken: Web site search performed on 1/4/2010 & 1/9/2010
Actions Needed:

Institution Number: 22			
Group	**Best Practice Adapted From Beringer (2007)**		**Y=1**
Governance & Administration	1	Adopts sustainability as a major guiding principle	1
	2	Championed by senior administration	1
	3	Strategy or approved sustainability policies	1
	4	Sustainability committee	0
	5	Dedicated faculty or staff time for campus sustainability	0
	6	Campus sustainability office	1
	7	Belongs to professional organizations for sustainability	1
	8	Conducts regular sustainability audits	0
	9	Regularly publishes a sustainability report	0
	10	Dedicates student fees to sustainability	0
	11	Received external awards for sustainability	1
Research & Scholarship	12	At least one sustainability-related research center or institute	1
	13	Endowed professor, chair or similar in sustainability	1
	14	Internal grant opportunities for sustainability initiatives	0
	15	Supports external funding applications for sustainability	1
Curriculum	16	Undergraduate, graduate and/or doctoral studies in sustainability, including a focus on interdisciplinary project-based learning	1
	17	Infuses sustainability themes in traditional disciplinary education	1
	18	Provides sustainability-related service-learning	1
	19	Provides opportunities for student sustainability research	1
	20	Includes sustainability themes in first-year student orientation	0
	21	Gives faculty and/or students the option of a sustainability pledge	0
	22	Frames (some of) its sustainability education by the UN DESD	0
Student Opportunities	23	Has one or more student environmental/social justice/sustainability groups	1
	24	Provides green dorm or sustainable living alternatives in residence/s	0
	25	Provides informal sustainability education opportunities which structure and foster a sustainable campus community life-world	1
Operations	26	Engages in waste, energy and water management, including resource minimization and recycling	1
	27	Commits to a GHG emissions reduction strategy	1
	28	Engages in transportation planning	1
	29	Exemplifies green building, design, construction and management	1
	30	Applies ecological principles in land use	1
	31	Commits to ethical procurement, including paper, and investment	1
	32	Subjects itself to EMS or SMS certification	0
Community Service & Outreach	33	Conducts educational outreach	1
	34	Sustainability-related events and conferences	1
	35	Established university-community partnerships and community projects	1
	36	Communicates its efforts and achievements via a web site, media and/or campus tours or flyers	1
Faculty & Staff Development	37	Provides faculty and staff development opportunities regarding sustainability	0
	38	Supports external funding applications	0
TOTAL SCORE			25

Source for Each Identified Best Practice by Line Number: Institution Number 22

Source for Each Identified Best Practice by Line Number

1. http://www.catalog.gatech.edu/general/mission.php Sustainability is embodied in mission statement
2. Signed President's Climate Commitment
3. Signed President's Climate Commitment
6. Marcia Kinstler, Sustainability Director, Office of Environmental Stewardship http://www.stewardship.gatech.edu/smartgrowth.php
7. AASHE member since 2007
11. http://www.stewardship.gatech.edu/awards.php
12. Strategic Energy Institute to bring together researchers from areas of policy, engineering, science, and earth and atmospheric sciences to craft a comprehensive, sustainable approach to the problems. http://sustainability.gatech.edu/index.php
13. Joining the Tech faculty in 1999, Dickinson has been the Endowed Chair of the Georgia Power/Georgia Research Alliance since 2000. For more than 40 years, Dickinson has researched the fields of climate modeling and global change.
School of Earth and Atmospheric Sciences (EAS) at Georgia Tech offers an interdisciplinary approach to the fundamental scientific principles of the earth, atmosphere, and oceans: Chair Judy Curry.
15. http://www.ecdm.gatech.edu/partnerships
http://www.me.gatech.edu/research/cae.shtml
16. Interdisciplinary design of new academic facilities has been recognized by Nature magazine as a leading approach. http://www.stewardship.gatech.edu/courses.php. Bachelor of Science in Environmental Engineering Stand-alone Degree. Doctor of Philosophy, Environmental Engineering. http://www.valdosta.edu/sra/documents/environ_sci_needs_assessment.pdf
17. http://www.facultysenate.gatech.edu/GFGFAAS2009-021009-M-Attach2b.pdf
The Institute has had a long-standing commitment for every student to take at least one course related to sustainability during their time at Tech. http://nique.net/news/100034
18. http://nique.net/news/99488 http://recycle.gatech.edu/newsletters/2009_10_newsletter.pdf
19. "From engineering to the liberal arts, departments across campus are making an effort to increase sustainability through ground breaking research. That's one thing that students can get involved in just by talking to a professor," Mallory said. http://nique.net/news/100034
23. http://sos.gatech.edu/node/10. http://www.stewardship.gatech.edu/studentinit.php.
25. http://www.stewardship.gatech.edu/volunteer2007.php.
http://sustainability.gatech.edu/initiatives.php.
26. http://www.sos.gatech.edu/node/13 Recycling. http://www.sos.gatech.edu/node/49 Energy
management.
http://www.stewardship.gatech.edu/energy.php
27. http://www.presidentsclimatecommitment.org/
28. http://www.stewardship.gatech.edu/alternativetransportation.php
29. http://www.stewardship.gatech.edu/sustainablebuildingsoverview.php
30. http://www.stewardship.gatech.edu/sustainablebuildingsoverview.php Eco commons
http://www.stewardship.gatech.edu/stormwater.php
31. http://www.stewardship.gatech.edu/greenpurchasing.php
33. http://www.sos.gatech.edu/node/43 http://www.sos.gatech.edu/node/18
34. http://sustainability.gatech.edu/events.php
35. http://service.gatech.edu/dev/plugins/content/index.php?id=7
http://www.sos.gatech.edu/ Beltline
http://www.coa.gatech.edu/news/event.php?id=3838
36. http://www.whistle.gatech.edu/archives/09/jan/5/jan5.pdf
Actions Taken: Website search performed 12/3/2009

Institution Number: 23			
Group	**Best Practice Adapted From Beringer (2007)**		**Y=1**
Governance & Administration	1	Adopts sustainability as a major guiding principle	0
	2	Championed by senior administration	0
	3	Strategy or approved sustainability policies	0
	4	Sustainability committee	0
	5	Dedicated faculty or staff time for campus sustainability	0
	6	Campus sustainability office	0
	7	Belongs to professional organizations for sustainability	0
	8	Conducts regular sustainability audits	0
	9	Regularly publishes a sustainability report	0
	10	Dedicates student fees to sustainability	0
	11	Received external awards for sustainability	0
Research & Scholarship	12	At least one sustainability-related research center or institute	0
	13	Endowed professor, chair or similar in sustainability	0
	14	Internal grant opportunities for sustainability initiatives	0
	15	Supports external funding applications for sustainability	0
Curriculum	16	Undergraduate, graduate and/or doctoral studies in sustainability, including a focus on interdisciplinary project-based learning	0
	17	Infuses sustainability themes in traditional disciplinary education	0
	18	Provides sustainability-related service-learning	0
	19	Provides opportunities for student sustainability research	0
	20	Includes sustainability themes in first-year student orientation	0
	21	Gives faculty and/or students the option of a sustainability pledge	0
	22	Frames (some of) its sustainability education by the UN DESD	0
Student Opportunities	23	Has one or more student environmental/social justice/sustainability groups	0
	24	Provides green dorm or sustainable living alternatives in residence/s	0
	25	Provides informal sustainability education opportunities which structure and foster a sustainable campus community life-world	0
Operations	26	Engages in waste, energy and water management, including resource minimization and recycling	0
	27	Commits to a GHG emissions reduction strategy	0
	28	Engages in transportation planning	0
	29	Exemplifies green building, design, construction and management	0
	30	Applies ecological principles in land use	0
	31	Commits to ethical procurement, including paper, and investment	0
	32	Subjects itself to EMS or SMS certification	0
Community Service & Outreach	33	Conducts educational outreach	0
	34	Sustainability-related events and conferences	0
	35	Established university-community partnerships and community projects	0
	36	Communicates its efforts and achievements via a web site, media and/or campus tours or flyers	0
Faculty & Staff Development	37	Provides faculty and staff development opportunities regarding sustainability	0
	38	Supports external funding applications	0
TOTAL SCORE			0

Source for Each Identified Best Practice by Line Number: Institution Number 23

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Actions Taken: Web site search performed on 1/9/2010
Actions Needed:

Institution Number: 24			
Group	**Best Practice Adapted From Beringer (2007)**		**Y=1**
Governance & Administration	1	Adopts sustainability as a major guiding principle	0
	2	Championed by senior administration	1
	3	Strategy or approved sustainability policies	1
	4	Sustainability committee	1
	5	Dedicated faculty or staff time for campus sustainability	0
	6	Campus sustainability office	1
	7	Belongs to professional organizations for sustainability	1
	8	Conducts regular sustainability audits	0
	9	Regularly publishes a sustainability report	0
	10	Dedicates student fees to sustainability	0
	11	Received external awards for sustainability	0
Research & Scholarship	12	At least one sustainability-related research center or institute	0
	13	Endowed professor, chair or similar in sustainability	0
	14	Internal grant opportunities for sustainability initiatives	0
	15	Supports external funding applications for sustainability	1
Curriculum	16	Undergraduate, graduate and/or doctoral studies in sustainability, including a focus on interdisciplinary project-based learning	0
	17	Infuses sustainability themes in traditional disciplinary education	0
	18	Provides sustainability-related service-learning	0
	19	Provides opportunities for student sustainability research	0
	20	Includes sustainability themes in first-year student orientation	0
	21	Gives faculty and/or students the option of a sustainability pledge	0
	22	Frames (some of) its sustainability education by the UN DESD	0
Student Opportunities	23	Has one or more student environmental/social justice/sustainability groups	1
	24	Provides green dorm or sustainable living alternatives in residence/s	0
	25	Provides informal sustainability education opportunities which structure and foster a sustainable campus community life-world	0
Operations	26	Engages in waste, energy and water management, including resource minimization and recycling	1
	27	Commits to a GHG emissions reduction strategy	1
	28	Engages in transportation planning	1
	29	Exemplifies green building, design, construction and management	1
	30	Applies ecological principles in land use	0
	31	Commits to ethical procurement, including paper, and investment	0
	32	Subjects itself to EMS or SMS certification	0
Community Service & Outreach	33	Conducts educational outreach	0
	34	Sustainability-related events and conferences	1
	35	Established university-community partnerships and community projects	0
	36	Communicates its efforts and achievements via a web site, media and/or campus tours or flyers	1
Faculty & Staff Development	37	Provides faculty and staff development opportunities regarding sustainability	0
	38	Supports external funding applications	0
TOTAL SCORE			13

Source for Each Identified Best Practice by Line Number: Institution Number 24

2. Signed the President's Climate Commitment
3. Signed the President's Climate Commitment
4. http://www.kennesaw.edu/sustainability/cccroster.shtml KSU Climate Commitment Council
6. R.C. Paul, Ph.D., Director of Sustainability and Professor of Biology
7. http://www.aashe.org/membership/members/institutional_members AASHE
15. https://web.kennesaw.edu/news/stories/ksu-receives-125000-wal-mart-grant-environmental-sustainability-project Wal-Mart grant
23. http://environmentalalliance.wikispaces.com/
26. Recycling
http://www.kennesaw.edu/sustainability/SP%20Recycling1/Why%20Recycle.html .
27. Signed the President's Climate Commitment http://www.ulsf.org/talloires_declaration.html Talloires signatory
http://www.kennesaw.edu/sustainability/recycling.shtml See Climate Action Plan.
28. http://www.ksuride.com/
29. http://www.kennesaw.edu/businessservices/Sept2009News/guest2.html Social Sciences building was either the first or second LEED (Leadership in Energy and Environmental Design) certified building in Georgia's university system. (We were running neck in neck with a project at Georgia Tech.) Two additional KSU buildings, the Commons Dining Hall and the Health Sciences building, are seeking LEED certification and the Science Laboratory Addition project is being planned to LEED specifications as well.
34. https://web.kennesaw.edu/news/stories/earth-day-2009-brings-environmental-awareness%E2%80%9A-fun-ksu-community-0
36. http://www.kennesaw.edu/sustainability/ Sustainability web site

Actions Taken: Web site search performed on 1/9/2010
Actions Needed:

Institution Number: 25			
Group	**Best Practice Adapted From Beringer (2007)**		**Y=1**
Governance & Administration	1	Adopts sustainability as a major guiding principle	0
	2	Championed by senior administration	0
	3	Strategy or approved sustainability policies	0
	4	Sustainability committee	0
	5	Dedicated faculty or staff time for campus sustainability	0
	6	Campus sustainability office	0
	7	Belongs to professional organizations for sustainability	0
	8	Conducts regular sustainability audits	0
	9	Regularly publishes a sustainability report	0
	10	Dedicates student fees to sustainability	0
	11	Received external awards for sustainability	0
Research & Scholarship	12	At least one sustainability-related research center or institute	0
	13	Endowed professor, chair or similar in sustainability	0
	14	Internal grant opportunities for sustainability initiatives	0
	15	Supports external funding applications for sustainability	0
Curriculum	16	Undergraduate, graduate and/or doctoral studies in sustainability, including a focus on interdisciplinary project-based learning	0
	17	Infuses sustainability themes in traditional disciplinary education	0
	18	Provides sustainability-related service-learning	0
	19	Provides opportunities for student sustainability research	0
	20	Includes sustainability themes in first-year student orientation	0
	21	Gives faculty and/or students the option of a sustainability pledge	0
	22	Frames (some of) its sustainability education by the UN DESD	0
Student Opportunities	23	Has one or more student environmental/social justice/sustainability groups	0
	24	Provides green dorm or sustainable living alternatives in residence/s	0
	25	Provides informal sustainability education opportunities which structure and foster a sustainable campus community life-world	0
Operations	26	Engages in waste, energy and water management, including resource minimization and recycling	0
	27	Commits to a GHG emissions reduction strategy	0
	28	Engages in transportation planning	0
	29	Exemplifies green building, design, construction and management	0
	30	Applies ecological principles in land use	0
	31	Commits to ethical procurement, including paper, and investment	0
	32	Subjects itself to EMS or SMS certification	0
Community Service & Outreach	33	Conducts educational outreach	0
	34	Sustainability-related events and conferences	0
	35	Established university-community partnerships and community projects	0
	36	Communicates its efforts and achievements via a web site, media and/or campus tours or flyers	0
Faculty & Staff Development	37	Provides faculty and staff development opportunities regarding sustainability	0
	38	Supports external funding applications	0
TOTAL SCORE			0

Source for Each Identified Best Practice by Line Number: Institution Number 25

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Actions Taken: Web site search performed on 1\10\2010
Actions Needed:

Institution Number: 26			
Group	**Best Practice Adapted From Beringer (2007)**		**Y=1**
Governance & Administration	1	Adopts sustainability as a major guiding principle	0
	2	Championed by senior administration	0
	3	Strategy or approved sustainability policies	0
	4	Sustainability committee	0
	5	Dedicated faculty or staff time for campus sustainability	0
	6	Campus sustainability office	0
	7	Belongs to professional organizations for sustainability	0
	8	Conducts regular sustainability audits	0
	9	Regularly publishes a sustainability report	0
	10	Dedicates student fees to sustainability	0
	11	Received external awards for sustainability	0
Research & Scholarship	12	At least one sustainability-related research center or institute	0
	13	Endowed professor, chair or similar in sustainability	0
	14	Internal grant opportunities for sustainability initiatives	0
	15	Supports external funding applications for sustainability	0
Curriculum	16	Undergraduate, graduate and/or doctoral studies in sustainability, including a focus on interdisciplinary project-based learning	0
	17	Infuses sustainability themes in traditional disciplinary education	0
	18	Provides sustainability-related service-learning	0
	19	Provides opportunities for student sustainability research	0
	20	Includes sustainability themes in first-year student orientation	0
	21	Gives faculty and/or students the option of a sustainability pledge	0
	22	Frames (some of) its sustainability education by the UN DESD	0
Student Opportunities	23	Has one or more student environmental/social justice/sustainability groups	1
	24	Provides green dorm or sustainable living alternatives in residence/s	0
	25	Provides informal sustainability education opportunities which structure and foster a sustainable campus community life-world	0
Operations	26	Engages in waste, energy and water management, including resource minimization and recycling	0
	27	Commits to a GHG emissions reduction strategy	
	28	Engages in transportation planning	0
	29	Exemplifies green building, design, construction and management	0
	30	Applies ecological principles in land use	0
	31	Commits to ethical procurement, including paper, and investment	0
	32	Subjects itself to EMS or SMS certification	0
Community Service & Outreach	33	Conducts educational outreach	0
	34	Sustainability-related events and conferences	0
	35	Established university-community partnerships and community projects	0
	36	Communicates its efforts and achievements via a web site, media and/or campus tours or flyers	0
Faculty & Staff Development	37	Provides faculty and staff development opportunities regarding sustainability	0
	38	Supports external funding applications	0
TOTAL SCORE			1

Source for Each Identified Best Practice by Line Number: Institution Number 26

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23. Wilderness Medicine Student Interest Group
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Actions Taken: Web site search performed on 1/10/2010
Actions Needed:

Institution Number: 27			
Group	**Best Practice Adapted From Beringer (2007)**		**Y=1**
Governance & Administration	1	Adopts sustainability as a major guiding principle	0
	2	Championed by senior administration	0
	3	Strategy or approved sustainability policies	0
	4	Sustainability committee	0
	5	Dedicated faculty or staff time for campus sustainability	0
	6	Campus sustainability office	0
	7	Belongs to professional organizations for sustainability	0
	8	Conducts regular sustainability audits	0
	9	Regularly publishes a sustainability report	0
	10	Dedicates student fees to sustainability	0
	11	Received external awards for sustainability	0
Research & Scholarship	12	At least one sustainability-related research center or institute	0
	13	Endowed professor, chair or similar in sustainability	0
	14	Internal grant opportunities for sustainability initiatives	0
	15	Supports external funding applications for sustainability	0
Curriculum	16	Undergraduate, graduate and/or doctoral studies in sustainability, including a focus on interdisciplinary project-based learning	0
	17	Infuses sustainability themes in traditional disciplinary education	0
	18	Provides sustainability-related service-learning	0
	19	Provides opportunities for student sustainability research	0
	20	Includes sustainability themes in first-year student orientation	0
	21	Gives faculty and/or students the option of a sustainability pledge	0
	22	Frames (some of) its sustainability education by the UN DESD	0
Student Opportunities	23	Has one or more student environmental/social justice/sustainability groups	0
	24	Provides green dorm or sustainable living alternatives in residence/s	0
	25	Provides informal sustainability education opportunities which structure and foster a sustainable campus community life-world	0
Operations	26	Engages in waste, energy and water management, including resource minimization and recycling	0
	27	Commits to a GHG emissions reduction strategy	0
	28	Engages in transportation planning	0
	29	Exemplifies green building, design, construction and management	0
	30	Applies ecological principles in land use	0
	31	Commits to ethical procurement, including paper, and investment	0
	32	Subjects itself to EMS or SMS certification	0
Community Service & Outreach	33	Conducts educational outreach	0
	34	Sustainability-related events and conferences	0
	35	Established university-community partnerships and community projects	0
	36	Communicates its efforts and achievements via a web site, media and/or campus tours or flyers	0
Faculty & Staff Development	37	Provides faculty and staff development opportunities regarding sustainability	0
	38	Supports external funding applications	0
TOTAL SCORE			0

Source for Each Identified Best Practice by Line Number: Institution Number 27

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Actions Taken: Web site search performed on 1/10/2010
Actions Needed:

Institution Number: 28			
Group	**Best Practice Adapted From Beringer (2007)**		**Y=1**
Governance & Administration	1	Adopts sustainability as a major guiding principle	0
	2	Championed by senior administration	0
	3	Strategy or approved sustainability policies	0
	4	Sustainability committee	0
	5	Dedicated faculty or staff time for campus sustainability	0
	6	Campus sustainability office	0
	7	Belongs to professional organizations for sustainability	0
	8	Conducts regular sustainability audits	0
	9	Regularly publishes a sustainability report	0
	10	Dedicates student fees to sustainability	0
	11	Received external awards for sustainability	0
Research & Scholarship	12	At least one sustainability-related research center or institute	1
	13	Endowed professor, chair or similar in sustainability	0
	14	Internal grant opportunities for sustainability initiatives	0
	15	Supports external funding applications for sustainability	1
Curriculum	16	Undergraduate, graduate and/or doctoral studies in sustainability, including a focus on interdisciplinary project-based learning	0
	17	Infuses sustainability themes in traditional disciplinary education	0
	18	Provides sustainability-related service-learning	0
	19	Provides opportunities for student sustainability research	0
	20	Includes sustainability themes in first-year student orientation	0
	21	Gives faculty and/or students the option of a sustainability pledge	0
	22	Frames (some of) its sustainability education by the UN DESD	0
Student Opportunities	23	Has one or more student environmental/social justice/sustainability groups	1
	24	Provides green dorm or sustainable living alternatives in residence/s	0
	25	Provides informal sustainability education opportunities which structure and foster a sustainable campus community life-world	0
Operations	26	Engages in waste, energy and water management, including resource minimization and recycling	0
	27	Commits to a GHG emissions reduction strategy	0
	28	Engages in transportation planning	0
	29	Exemplifies green building, design, construction and management	0
	30	Applies ecological principles in land use	0
	31	Commits to ethical procurement, including paper, and investment	0
	32	Subjects itself to EMS or SMS certification	0
Community Service & Outreach	33	Conducts educational outreach	1
	34	Sustainability-related events and conferences	0
	35	Established university-community partnerships and community projects	0
	36	Communicates its efforts and achievements via a web site, media and/or campus tours or flyers	0
Faculty & Staff Development	37	Provides faculty and staff development opportunities regarding sustainability	0
	38	Supports external funding applications	0
TOTAL SCORE			4

Source for Each Identified Best Practice by Line Number: Institution Number 28

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12. http://www.northgeorgia.edu/EnvironmentalLeadership/ Environmental Leadership Center
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15. http://www.northgeorgia.edu/EnvironmentalLeadership/
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23. Environmental Awareness Club (Protect) http://apache.northgeorgia.edu/Stu_Lif/sto&apg.htm
24.
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34. http://www.northgeorgia.edu/EnvironmentalLeadership/
35.
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Actions Taken: Web site search performed on 1/10/2010
Actions Needed:

Institution Number: 29			
Group	**Best Practice Adapted From Beringer (2007)**		**Y=1**
Governance & Administration	1	Adopts sustainability as a major guiding principle	0
	2	Championed by senior administration	0
	3	Strategy or approved sustainability policies	0
	4	Sustainability committee	0
	5	Dedicated faculty or staff time for campus sustainability	0
	6	Campus sustainability office	0
	7	Belongs to professional organizations for sustainability	0
	8	Conducts regular sustainability audits	0
	9	Regularly publishes a sustainability report	0
	10	Dedicates student fees to sustainability	0
	11	Received external awards for sustainability	0
Research & Scholarship	12	At least one sustainability-related research center or institute	0
	13	Endowed professor, chair or similar in sustainability	0
	14	Internal grant opportunities for sustainability initiatives	0
	15	Supports external funding applications for sustainability	0
Curriculum	16	Undergraduate, graduate and/or doctoral studies in sustainability, including a focus on interdisciplinary project-based learning	1
	17	Infuses sustainability themes in traditional disciplinary education	0
	18	Provides sustainability-related service-learning	0
	19	Provides opportunities for student sustainability research	0
	20	Includes sustainability themes in first-year student orientation	0
	21	Gives faculty and/or students the option of a sustainability pledge	0
	22	Frames (some of) its sustainability education by the UN DESD	0
Student Opportunities	23	Has one or more student environmental/social justice/sustainability groups	0
	24	Provides green dorm or sustainable living alternatives in residence/s	0
	25	Provides informal sustainability education opportunities which structure and foster a sustainable campus community life-world	0
Operations	26	Engages in waste, energy and water management, including resource minimization and recycling	0
	27	Commits to a GHG emissions reduction strategy	0
	28	Engages in transportation planning	0
	29	Exemplifies green building, design, construction and management	0
	30	Applies ecological principles in land use	0
	31	Commits to ethical procurement, including paper, and investment	0
	32	Subjects itself to EMS or SMS certification	0
Community Service & Outreach	33	Conducts educational outreach	0
	34	Sustainability-related events and conferences	0
	35	Established university-community partnerships and community projects	0
	36	Communicates its efforts and achievements via a web site, media and/or campus tours or flyers	0
Faculty & Staff Development	37	Provides faculty and staff development opportunities regarding sustainability	0
	38	Supports external funding applications	0
TOTAL SCORE			1

Source for Each Identified Best Practice by Line Number: Institution Number 29

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16. Bachelor of Science Environmental Studies
http://www.valdosta.edu/sra/documents/environ_sci_needs_assessment.pdf
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Actions Taken: Web site search performed 1/16/2010
Actions Needed:

Institution Number: 30-Excluded Because of Status as Non-Degree Granting Research Institute			
Group	**Best Practice Adapted From Beringer (2007)**		**Y=1**
Governance & Administration	1	Adopts sustainability as a major guiding principle	
	2	Championed by senior administration	
	3	Strategy or approved sustainability policies	
	4	Sustainability committee	
	5	Dedicated faculty or staff time for campus sustainability	
	6	Campus sustainability office	
	7	Belongs to professional organizations for sustainability	
	8	Conducts regular sustainability audits	
	9	Regularly publishes a sustainability report	
	10	Dedicates student fees to sustainability	
	11	Received external awards for sustainability	
Research & Scholarship	12	At least one sustainability-related research center or institute	
	13	Endowed professor, chair or similar in sustainability	
	14	Internal grant opportunities for sustainability initiatives	
	15	Supports external funding applications for sustainability	
Curriculum	16	Undergraduate, graduate and/or doctoral studies in sustainability, including a focus on interdisciplinary project-based learning	
	17	Infuses sustainability themes in traditional disciplinary education	
	18	Provides sustainability-related service-learning	
	19	Provides opportunities for student sustainability research	
	20	Includes sustainability themes in first-year student orientation	
	21	Gives faculty and/or students the option of a sustainability pledge	
	22	Frames (some of) its sustainability education by the UN DESD	
Student Opportunities	23	Has one or more student environmental/social justice/sustainability groups	
	24	Provides green dorm or sustainable living alternatives in residence/s	
	25	Provides informal sustainability education opportunities which structure and foster a sustainable campus community life-world	
Operations	26	Engages in waste, energy and water management, including resource minimization and recycling	
	27	Commits to a GHG emissions reduction strategy	
	28	Engages in transportation planning	
	29	Exemplifies green building, design, construction and management	
	30	Applies ecological principles in land use	
	31	Commits to ethical procurement, including paper, and investment	
	32	Subjects itself to EMS or SMS certification	
Community Service & Outreach	33	Conducts educational outreach	
	34	Sustainability-related events and conferences	
	35	Established university-community partnerships and community projects	
	36	Communicates its efforts and achievements via a web site, media and/or campus tours or flyers	
Faculty & Staff Development	37	Provides faculty and staff development opportunities regarding sustainability	
	38	Supports external funding applications	
TOTAL SCORE			

Source for Each Identified Best Practice by Line Number: Institution Number 30

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Actions Taken:
Actions Needed:

Institution Number: 31			
Group	**Best Practice Adapted From Beringer (2007)**		**Y=1**
Governance & Administration	1	Adopts sustainability as a major guiding principle	0
	2	Championed by senior administration	0
	3	Strategy or approved sustainability policies	0
	4	Sustainability committee	0
	5	Dedicated faculty or staff time for campus sustainability	0
	6	Campus sustainability office	0
	7	Belongs to professional organizations for sustainability	0
	8	Conducts regular sustainability audits	0
	9	Regularly publishes a sustainability report	0
	10	Dedicates student fees to sustainability	0
	11	Received external awards for sustainability	0
Research & Scholarship	12	At least one sustainability-related research center or institute	0
	13	Endowed professor, chair or similar in sustainability	0
	14	Internal grant opportunities for sustainability initiatives	0
	15	Supports external funding applications for sustainability	0
Curriculum	16	Undergraduate, graduate and/or doctoral studies in sustainability, including a focus on interdisciplinary project-based learning	0
	17	Infuses sustainability themes in traditional disciplinary education	0
	18	Provides sustainability-related service-learning	0
	19	Provides opportunities for student sustainability research	0
	20	Includes sustainability themes in first-year student orientation	0
	21	Gives faculty and/or students the option of a sustainability pledge	0
	22	Frames (some of) its sustainability education by the UN DESD	0
Student Opportunities	23	Has one or more student environmental/social justice/sustainability groups	1
	24	Provides green dorm or sustainable living alternatives in residence/s	1
	25	Provides informal sustainability education opportunities which structure and foster a sustainable campus community life-world	0
Operations	26	Engages in waste, energy and water management, including resource minimization and recycling	0
	27	Commits to a GHG emissions reduction strategy	0
	28	Engages in transportation planning	0
	29	Exemplifies green building, design, construction and management	0
	30	Applies ecological principles in land use	0
	31	Commits to ethical procurement, including paper, and investment	0
	32	Subjects itself to EMS or SMS certification	0
Community Service & Outreach	33	Conducts educational outreach	0
	34	Sustainability-related events and conferences	0
	35	Established university-community partnerships and community projects	0
	36	Communicates its efforts and achievements via a web site, media and/or campus tours or flyers	0
Faculty & Staff Development	37	Provides faculty and staff development opportunities regarding sustainability	0
	38	Supports external funding applications	0
TOTAL SCORE			2

Source for Each Identified Best Practice by Line Number: Institution Number 31

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23. Environmental Awareness Club http://www.sgc.edu/student_life/clubs_organizations.html
24. http://www.sgc.edu/student_life/pdf/residencehallhandbook.pdf
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Actions Taken: Web site search performed on 1/16/10
Actions Needed:

Institution Number: 32			
Group	**Best Practice Adapted From Beringer (2007)**		**Y=1**
Governance & Administration	1	Adopts sustainability as a major guiding principle	1
	2	Championed by senior administration	1
	3	Strategy or approved sustainability policies	1
	4	Sustainability committee	1
	5	Dedicated faculty or staff time for campus sustainability	0
	6	Campus sustainability office	1
	7	Belongs to professional organizations for sustainability	1
	8	Conducts regular sustainability audits	0
	9	Regularly publishes a sustainability report	0
	10	Dedicates student fees to sustainability	0
	11	Received external awards for sustainability	0
Research & Scholarship	12	At least one sustainability-related research center or institute	0
	13	Endowed professor, chair or similar in sustainability	0
	14	Internal grant opportunities for sustainability initiatives	0
	15	Supports external funding applications for sustainability	0
Curriculum	16	Undergraduate, graduate and/or doctoral studies in sustainability, including a focus on interdisciplinary project-based learning	0
	17	Infuses sustainability themes in traditional disciplinary education	*
	18	Provides sustainability-related service-learning	0
	19	Provides opportunities for student sustainability research	0
	20	Includes sustainability themes in first-year student orientation	0
	21	Gives faculty and/or students the option of a sustainability pledge	0
	22	Frames (some of) its sustainability education by the UN DESD	0
Student Opportunities	23	Has one or more student environmental/social justice/sustainability groups	0
	24	Provides green dorm or sustainable living alternatives in residence/s	0
	25	Provides informal sustainability education opportunities which structure and foster a sustainable campus community life-world	0
Operations	26	Engages in waste, energy and water management, including resource minimization and recycling	0
	27	Commits to a GHG emissions reduction strategy	1
	28	Engages in transportation planning	*
	29	Exemplifies green building, design, construction and management	1
	30	Applies ecological principles in land use	0
	31	Commits to ethical procurement, including paper, and investment	0
	32	Subjects itself to EMS or SMS certification	0
Community Service & Outreach	33	Conducts educational outreach	0
	34	Sustainability-related events and conferences	1
	35	Established university-community partnerships and community projects	1
	36	Communicates its efforts and achievements via a web site, media and/or campus tours or flyers	0
Faculty & Staff Development	37	Provides faculty and staff development opportunities regarding sustainability	0
	38	Supports external funding applications	0
TOTAL SCORE			10

Source for Each Identified Best Practice by Line Number: Institution Number 32

1. http://www.spsu.edu/home/about/message.html
2. http://www.spsu.edu/home/about/si/Notesmeeting042507.htm Charter signatory, President's Climate Commitment
3. Ditto
4. http://www.spsu.edu/home/about/si.html
6. Executive Director of Strategic Marketing and Sustainability Initiatives, Jim Cooper
7. http://www.aashe.org/membership/members/institutional_members AASHE member
   USGBC member.
17. http://www.spsu.edu/aa/Deans%20Council%20Meeting%202-18-2009.htm See "Incorporating Sustainability"
    http://www.spsu.edu/greencourses/ List of sustainability-related courses linked from President's page
27. http://www.spsu.edu/home/about/si/Notesmeeting042507.htm Charter signatory, President's Climate
    Commitment http://advancement.spsu.edu/pub_rel/PresidentsClimateCommitment.html
28. Auxiliaries 2008-2009 Goal 1 is to develop a comprehensive transportation plan. Plan not found.
29. 1/22/10 interview with Vice Chancellor Neuse has direct knowledge of commitment from President Leland to
    LEED rating for all know buildings.
    Also, http://www.spsu.edu/cnst/CNSTWEB/General%20Information/News_Events.htm
34. http://www.spsu.edu/staffcouncil/documents/StaffCouncilMinutes11-12-08.pdf Sustainability
    Awareness Day
    http://www.spsu.edu/gogreen/ Go Green 2010 Faculty-Staff Campaign
35. Green Corridor concept with City of Marietta and others
    http://www.mariettaga.gov/ggtc/docs/9-22- 08_mtg_notes.pdf

Actions Taken: Web site search performed on 1/16/2010.
Actions Needed:

Institution Number: 33			
Group	**Best Practice Adapted From Beringer (2007)**		**Y=1**
Governance & Administration	1	Adopts sustainability as a major guiding principle	0
	2	Championed by senior administration	0
	3	Strategy or approved sustainability policies	0
	4	Sustainability committee	*
	5	Dedicated faculty or staff time for campus sustainability	0
	6	Campus sustainability office	0
	7	Belongs to professional organizations for sustainability	*
	8	Conducts regular sustainability audits	0
	9	Regularly publishes a sustainability report	0
	10	Dedicates student fees to sustainability	0
	11	Received external awards for sustainability	1
Research & Scholarship	12	At least one sustainability-related research center or institute	1
	13	Endowed professor, chair or similar in sustainability	0
	14	Internal grant opportunities for sustainability initiatives	0
	15	Supports external funding applications for sustainability	1
Curriculum	16	Undergraduate, graduate and/or doctoral studies in sustainability, including a focus on interdisciplinary project-based learning	1
	17	Infuses sustainability themes in traditional disciplinary education	1
	18	Provides sustainability-related service-learning	0
	19	Provides opportunities for student sustainability research	1
	20	Includes sustainability themes in first-year student orientation	0
	21	Gives faculty and/or students the option of a sustainability pledge	0
	22	Frames (some of) its sustainability education by the UN DESD	0
Student Opportunities	23	Has one or more student environmental/social justice/sustainability groups	1
	24	Provides green dorm or sustainable living alternatives in residence/s	1
	25	Provides informal sustainability education opportunities which structure and foster a sustainable campus community life-world	0
Operations	26	Engages in waste, energy and water management, including resource minimization and recycling	1
	27	Commits to a GHG emissions reduction strategy	0
	28	Engages in transportation planning	1
	29	Exemplifies green building, design, construction and management	1
	30	Applies ecological principles in land use	1
	31	Commits to ethical procurement, including paper, and investment	1
	32	Subjects itself to EMS or SMS certification	0
Community Service & Outreach	33	Conducts educational outreach	1
	34	Sustainability-related events and conferences	0
	35	Established university-community partnerships and community projects	0
	36	Communicates its efforts and achievements via a web site, media and/or campus tours or flyers	1
Faculty & Staff Development	37	Provides faculty and staff development opportunities regarding sustainability	0
	38	Supports external funding applications	0
TOTAL SCORE			15

Source for Each Identified Best Practice by Line Number: Institution Number 33

4. Working Group has recommended establishment of oversight committee.
http://www.uga.edu/UGA_Sustainability_Report_Oct_09.pdf
7. Formerly, but not currently, a member of AASHE. Working group has recommended re-joining.
11. In 2007, UGA won the Georgia Water Wise Council Water Conservation Award. SARE grants
http://www.southernsare.uga.edu/aboutus.htm
12. http://www.academyoftheenvironment.com/
15. http://www.southernsare.uga.edu/aboutus.htm
16. More than 60 degree programs related to sustainability:
http://www.uga.edu/UGA_Sustainability_Report_Oct_09.pdf B.S. in Environmental
Engineering, Stand-alone Degree. B.S. in Environmental Health, Stand-alone Degree. B.S. in
Environmental
Sciences. B.S. in Environmental Economics and Management, B.S. in Environmental Sciences,
Environmental
Chemistry. B.S. in Environmental Sciences, Environmental Resource Science. Certificate of Less than
One
Year, Environmental Ethics. Master of Environmental Planning and Design, Stand-alone Degree. M.S.
Environmental Engineering. M.S. in Environmental Health.
http://www.valdosta.edu/sra/documents/environ_sci_needs_assessment.pdf
17. One of the first to require students to complete a course that enables them to attain knowledge of
basic principles concerning environmental issues
(http://bulletin.uga.edu/Bulletin_Files/uga_req.html#Environmental)
19. See number 16.
23. http://www.law.uga.edu/ejf/?q=ejf/

https://stuorg.stuact.uga.edu/PublicOrganization/View.action?id=0040b8b01be6a0d1011be7be7e970007
24.
https://stuorg.stuact.uga.edu/PublicOrganization/View.action?id=0040b8b01be6a0d1011be7be7e970007
26. The University is embarking upon an ambitious recycling program, with 35% of its waste (an
increase of one ton per week over 2008) already diverted from landfills.
http://www.uga.edu/UGA_Sustainability_Report_Oct_09.pdf. PPD Sustainability Initiative
27.
28. http://www.camplan.uga.edu/campussustainability.html
29. http://www.camplan.uga.edu/campussustainability.html
30. http://www.camplan.uga.edu/campussustainability.html
In the past 15 years, the University has removed 1.5 million square feet of asphalt and added 46
acres of campus greenspace. http://www.uga.edu/UGA_Sustainability_Report_Oct_09.pdf
31. http://www.busfin.uga.edu/procurement/proprint.htm
33. http://www.uga.edu/service/pso.html Center for Biodiversity and Ecosystem Processes, Cooperative
Extension,
Cooperative Extension
36. http://gogreen.uga.edu/

Actions Taken: Website search performed on 12/3/2009 and 1/23/2010
Actions Needed:

Institution Number: 34			
Group	**Best Practice Adapted From Beringer (2007)**		**Y=1**
Governance & Administration	1	Adopts sustainability as a major guiding principle	0
	2	Championed by senior administration	1
	3	Strategy or approved sustainability policies	0
	4	Sustainability committee	1
	5	Dedicated faculty or staff time for campus sustainability	0
	6	Campus sustainability office	0
	7	Belongs to professional organizations for sustainability	0
	8	Conducts regular sustainability audits	0
	9	Regularly publishes a sustainability report	0
	10	Dedicates student fees to sustainability	0
	11	Received external awards for sustainability	*
Research & Scholarship	12	At least one sustainability-related research center or institute	0
	13	Endowed professor, chair or similar in sustainability	0
	14	Internal grant opportunities for sustainability initiatives	0
	15	Supports external funding applications for sustainability	0
Curriculum	16	Undergraduate, graduate and/or doctoral studies in sustainability, including a focus on interdisciplinary project-based learning	1
	17	Infuses sustainability themes in traditional disciplinary education	0
	18	Provides sustainability-related service-learning	0
	19	Provides opportunities for student sustainability research	0
	20	Includes sustainability themes in first-year student orientation	0
	21	Gives faculty and/or students the option of a sustainability pledge	0
	22	Frames (some of) its sustainability education by the UN DESD	0
Student Opportunities	23	Has one or more student environmental/social justice/sustainability groups	1
	24	Provides green dorm or sustainable living alternatives in residence/s	0
	25	Provides informal sustainability education opportunities which structure and foster a sustainable campus community life-world	1
Operations	26	Engages in waste, energy and water management, including resource minimization and recycling	*
	27	Commits to a GHG emissions reduction strategy	0
	28	Engages in transportation planning	0
	29	Exemplifies green building, design, construction and management	0
	30	Applies ecological principles in land use	0
	31	Commits to ethical procurement, including paper, and investment	0
	32	Subjects itself to EMS or SMS certification	0
Community Service & Outreach	33	Conducts educational outreach	0
	34	Sustainability-related events and conferences	1
	35	Established university-community partnerships and community projects	0
	36	Communicates its efforts and achievements via a web site, media and/or campus tours or flyers	0
Faculty & Staff Development	37	Provides faculty and staff development opportunities regarding sustainability	0
	38	Supports external funding applications	0
TOTAL SCORE			6

Source for Each Identified Best Practice by Line Number: Institution Number 34

2. Dr. Sethna's Red, White, Blue & Green article
http://www.presidentialperspectives.org/pdf/2008/chapter01.pdf
3.
4. http://www.westga.edu/energy/index_2243.php Dr. Sethna in article in number 2 says sustainability efforts championed in Energy Committee. Energy Committee activity appears to stop in 2007.
11. Dr. Sethna speaks of several awards in the article. Could not find these on the web site.
16. Bachelor of Science in Environmental Science, Stand-alone Degree. Bachelor of Science in Environmental
Studies, Stand-alone Degree.
23. http://www.facebook.com/group.php?gid=72404643367&ref=ts Love Not Litter
24.
25. http://www2.westga.edu/fyp/index_5622.php IServe First Year Mentoring Program, "Going Green" focus
http://www.westga.edu/assetsDept/excel/Fall_2009_Projects(2).pdf
26. "…there is no university-wide collection of all these recyclable materials…"
http://www.westga.edu/~chronicle/archive/42-04/wg_voices.html
34. http://www.westga.edu/~chronicle/archive/42-04/articles/earth.html Earth Day. Also, two-day state-wide event, sponsored by UWG's Thomas B. Murphy Center for Public Service and the
Department of Geosciences, is a Green Initiative with the long-term goal of understanding the political and
Scientific aspects of water issues. http://www.westga.edu/~ucm/report/recycling.pdf Electronic recycling event.

Actions Taken: Web search performed on 1/19/2010
Actions Needed:

Institution Number: 35			
Group	**Best Practice Adapted From Beringer (2007)**		**Y=1**
Governance & Administration	1	Adopts sustainability as a major guiding principle	0
	2	Championed by senior administration	1
	3	Strategy or approved sustainability policies	1
	4	Sustainability committee	1
	5	Dedicated faculty or staff time for campus sustainability	0
	6	Campus sustainability office	0
	7	Belongs to professional organizations for sustainability	0
	8	Conducts regular sustainability audits	0
	9	Regularly publishes a sustainability report	0
	10	Dedicates student fees to sustainability	0
	11	Received external awards for sustainability	0
Research & Scholarship	12	At least one sustainability-related research center or institute	0
	13	Endowed professor, chair or similar in sustainability	0
	14	Internal grant opportunities for sustainability initiatives	0
	15	Supports external funding applications for sustainability	0
Curriculum	16	Undergraduate, graduate and/or doctoral studies in sustainability, including a focus on interdisciplinary project-based learning	1
	17	Infuses sustainability themes in traditional disciplinary education	*
	18	Provides sustainability-related service-learning	*
	19	Provides opportunities for student sustainability research	*
	20	Includes sustainability themes in first-year student orientation	0
	21	Gives faculty and/or students the option of a sustainability pledge	0
	22	Frames (some of) its sustainability education by the UN DESD	0
Student Opportunities	23	Has one or more student environmental/social justice/sustainability groups	1
	24	Provides green dorm or sustainable living alternatives in residence/s	0
	25	Provides informal sustainability education opportunities which structure and foster a sustainable campus community life-world	0
Operations	26	Engages in waste, energy and water management, including resource minimization and recycling	*
	27	Commits to a GHG emissions reduction strategy	1
	28	Engages in transportation planning	*
	29	Exemplifies green building, design, construction and management	*
	30	Applies ecological principles in land use	0
	31	Commits to ethical procurement, including paper, and investment	0
	32	Subjects itself to EMS or SMS certification	0
Community Service & Outreach	33	Conducts educational outreach	0
	34	Sustainability-related events and conferences	0
	35	Established university-community partnerships and community projects	0
	36	Communicates its efforts and achievements via a web site, media and/or campus tours or flyers	1
Faculty & Staff Development	37	Provides faculty and staff development opportunities regarding sustainability	0
	38	Supports external funding applications	0
TOTAL SCORE			7

Source for Each Identified Best Practice by Line Number: Institution Number 35

1.
2. http://www.valdosta.edu/news/releases/Commitment.042409/ President's Climate Commitment
3. http://www.valdosta.edu/news/releases/Commitment.042409/ President's Climate Commitment. Plan-
http://www.valdosta.edu/finadmin/plantops/documents/ExecSumVSUClimatePlan.pdf
4. http://www.valdosta.edu/finadmin/plantops/ClimateChange.shtml Climate Council
http://www.valdosta.edu/eic/ Environmental Issues Committee (Faculty Senate)
5.
6.
7.
8.
9.
10.
11.
12.
13.
14.
15.
16. Associate of Applied Science in Services, Environmental Horticulture and a Bachelor of Science Environmental
Geosciences http://www.valdosta.edu/sra/documents/environ_sci_needs_assessment.pdf
17. Climate committee recommendation: Teaching, Research and Curriculum Subcommittee
18. Climate committee recommendation
19. Climate committee recommendation
20.
21.
22.
23. http://www.valdosta.edu/~bergstrm/save.html Students Against Violating the Environment (SAVE)
24.
25.
26. http://www.valdosta.edu/finadmin/plantops/recycling.shtml Recycling
http://view2.fatspaniel.net/PV2Web/merge?&view=PV/standard/HostedDetail&eid=198527 PV generation
Subcommittee created by Climate Committee
27. http://www.valdosta.edu/news/releases/Commitment.042409/ President's Climate Commitment
28. Climate committee recommendation
29. http://www.valdosta.edu/finadmin/plantops/documents/2008_Design_Standards-_PDF.pdf Expressed preference for LEED, all else being equal
30.
31.
32.
33.
34.
35.
36. http://www.valdosta.edu/finadmin/plantops/recycling.shtml
37.
38.

Actions Taken: Web site search performed on 1/19/2010
Actions Needed:

Institution Number: 36			
Group	**Best Practice Adapted From Beringer (2007)**		**Y=1**
Governance & Administration	1	Adopts sustainability as a major guiding principle	0
	2	Championed by senior administration	0
	3	Strategy or approved sustainability policies	0
	4	Sustainability committee	0
	5	Dedicated faculty or staff time for campus sustainability	0
	6	Campus sustainability office	0
	7	Belongs to professional organizations for sustainability	0
	8	Conducts regular sustainability audits	0
	9	Regularly publishes a sustainability report	0
	10	Dedicates student fees to sustainability	0
	11	Received external awards for sustainability	0
Research & Scholarship	12	At least one sustainability-related research center or institute	0
	13	Endowed professor, chair or similar in sustainability	0
	14	Internal grant opportunities for sustainability initiatives	0
	15	Supports external funding applications for sustainability	0
Curriculum	16	Undergraduate, graduate and/or doctoral studies in sustainability, including a focus on interdisciplinary project-based learning	0
	17	Infuses sustainability themes in traditional disciplinary education	0
	18	Provides sustainability-related service-learning	0
	19	Provides opportunities for student sustainability research	0
	20	Includes sustainability themes in first-year student orientation	0
	21	Gives faculty and/or students the option of a sustainability pledge	0
	22	Frames (some of) its sustainability education by the UN DESD	0
Student Opportunities	23	Has one or more student environmental/social justice/sustainability groups	0
	24	Provides green dorm or sustainable living alternatives in residence/s	0
	25	Provides informal sustainability education opportunities which structure and foster a sustainable campus community life-world	0
Operations	26	Engages in waste, energy and water management, including resource minimization and recycling	0
	27	Commits to a GHG emissions reduction strategy	0
	28	Engages in transportation planning	0
	29	Exemplifies green building, design, construction and management	0
	30	Applies ecological principles in land use	0
	31	Commits to ethical procurement, including paper, and investment	0
	32	Subjects itself to EMS or SMS certification	0
Community Service & Outreach	33	Conducts educational outreach	0
	34	Sustainability-related events and conferences	0
	35	Established university-community partnerships and community projects	0
	36	Communicates its efforts and achievements via a web site, media and/or campus tours or flyers	0
Faculty & Staff Development	37	Provides faculty and staff development opportunities regarding sustainability	0
	38	Supports external funding applications	0
TOTAL SCORE			0

Source for Each Identified Best Practice by Line Number: Institution Number 36

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Actions Taken: Web site search performed on 1/23/2010
Actions Needed:

APPENDIX B

APPA FPI DATA DEFINITIONS

Source: APPA Facilities Performance Indicators – Fiscal Year 2007-2008 User Report

Directory Metric 21 is from USG energy data collected annually.

Metric 1: Student Official FTE Enrollment.

Definition: *STUDENT ENROLLMENT Fall 2007 full-time equivalent (FTE) enrollment. Use the number that your institution reports as its official 2007-08 year FTE*

Metric2: Total Facilities FTE

Definition: *Total regular Facilities full-time equivalent employees (as versus headcount). 1 FTE = one person working 100% time for a full year. 1 FTE =two persons working 50% time for a full year.*

Metric 3: Building GSF Maintained by Facilities (Converted to GSF)

Definition: *The portion of the total campus building area (including rental/leased space) that i*s maintained by the institution's facilities department. Does not include GSF maintained by separate housing, athletic, or other auxiliary facilities operations.

Metric 4: Total Acres Maintained (Converted to ACRE)

Definition: *Total acres maintained by facilities department. This entry excludes farmland, reserves, and property that are not routinely maintained. Areas tended for fire protection are usually excluded. This entry includes the footprint of buildings.*

Metric 5: Annual Facility Operating Expenditure (Converted to DOL)

Definition: *Annual Facility Operating Expenditure (including benefits)*: The amount reported should at least equal the sum of operating costs reported in survey Section II. The scope of this entry is all facilities core functions required for ongoing, routine operations and maintenance of a building. Operations and maintenance activities include the labor and material costs necessary for costs necessary for Administration of the facilities operation; • The renovation and construction Renovation/Construction/ A&E); • Regular and MMBTUs maintenance of a building and its basic*

systems or utilities (e.g., roof, electrical and mechanical systems, floors and ceilings and walls, plumbing, elevators, fire alarms); Major maintenance funded by the Annual Facilities Maintenance Operating Budget;• Grounds (e.g., landscape, roads, and pathways); •Cleaning • Landscaping and grounds maintenance• Infrastructure (e.g., central plant, electrical distribution, water and systems.), including cost of water and sewer services but not purchased or co-generated other utilities. EXCLUDE EXPENDITURES: • Major maintenance or capital renewal funded by other institutional accounts that are separate from, and not included in, the facilities operating budget; • Purchased Utilities

Metric 6: Gross Institutional Expenditures (Converted to DOL)

Definition: *The total expenditures as reported by the campus for the fiscal year. If auxiliary services are excluded from your survey entries, the auxiliary expenditures are also excluded from this entry.*

Metric 7: Facilities Operating Expenditures per GIE

Definition: *Percent of the institutions gross annual expenditures invested in maintenance and operation of facilities*

Metric 8: Facilities operating Expenditures per GSF

Definition: *The annual amount invested per campus building GSF in maintenance and operation of facilities*

Metric 9: Energy Total Cost per GSF with Purchased Utilities

Definition: *Calculation of total Energy Costs w/Purch Util per Energy GSF*

Metric 10: Total Cost All Op Functions w/PU per Student

Definition: *Total operating costs for all functions with purchased utilities per student FTE*

Metric 11: Construction Cost per Student FTE

Definition: *Construction/A&E operating costs per student FTE*

Metric 12: Constr Cost as Percent Total Operating Costs w/o Purch Utilities

Definition: *Measure of Construction/A&E costs in relation to total Operating Costs without purchased utilities*

Metric 13: Custodial Total Cost per Student FTE

Definition: *Custodial operating costs per student FTE*

Metric 14: Custod Cost as Percent Total Operating Costs wo Purch Utilities

Definition: *Measure of Custodial costs as % of Total Operating Costs without purchased utilities.*

Metric 15: Energy Cost per Student FTE with Purchased Utilities

Definition: *Energy/Utilities operating costs with purchased utilities per student FTE*

Metric 16: Energy Cost as Percent Total Operating Costs without Purch Utilities

Definition: *Percent of total operating costs spent on Energy/Utilities without Purchased utilities*

Metric 17: Grounds Total Cost per Student FTE

Definition: *Landscaping/Grounds total operating costs per student FTE*

Metric 18: Grounds Cost as Percent Total Operating Costs wo Purch Utilities

Definition: *The portion of total operating costs without purchased utilities spent on Landscaping/Grounds*

Metric 19: Maintenance Total Cost per Student FTE

Definition: *Maintenance operating costs per student FTE*

Metric 20: Maint Cost as Percent Total Operating Costs wo Purch Utilities

Definition: *The percent of total operating costs without purchased utilities spent on maintenance.*

Metric 21: BTU/SF

Definition: *Total energy, all sources, per square foot of conditioned space.*

APPENDIX C

DATA TABLE FOR CORRELATION ANALYSIS

Table 9: SPSS correlation table for correlation analysis, 21 variables

Institution	Sus Score	1 Student FTE	6 GIE	2 TI Fac FTE
USG-1	1	3525	38000000	
USG-2	0	4379		32
USG-3	5	6848	64384896	30.5
USG-4	0		14900000	
USG-5	2	6500	58161414	100
USG-6	1	2036	24164749	36
USG-7	3	4931	62368063	52
USG-8	0	2962	23421576	25
USG-9	7	7590	82962343	100
USG-10	1	4532	31380005	26.5
USG-11	11	3438	39012011	12
USG-12	1	1779	13130544	16.75
USG-13	5	2433	23000000	46
USG-14	5	7476	42694431	49
USG-15	8	5631	87100845	104
USG-16	5	695	19000000	3
USG-17	2	3557	29871640	18.5
USG-18	0	22800	142000000	167
USG-19	16	16841	215326268	291
USG-20	4	2128	17574829	21
USG-21	7	23766	538735425	312
USG-22	25	17832	980433038	448
USG-23	0	3703	18964196	34
USG-24	13	18076	172696221	122
USG-25	0	4957	51189401.48	27.5
USG-26	1	2392	590268506	157.15
USG-27	0	2951	31370997	33
USG-28	4	5227	44348906	55
USG-29	1	3535	52342957	36
USG-30	0		7805635	9.5
USG-31	2	1209	16962062	25
USG-32	10	4429	42551801.12	52
USG-33	15	33831	999093428	805
USG-34	6	10677	104619816	151
USG-35	7	10286	136645014	159
USG-36	0	788	7098813	15

Table 9: SPSS correlation table, cont.

Institution	3 GSF Maint	4 TI Acres Maint
USG-1	548280	129
USG-2		231
USG-3	856342	121
USG-4	254998	64
USG-5	956326	126
USG-6	191053	198
USG-7	690384	175.4
USG-8	345711	155
USG-9	1900490	137
USG-10	389457	141
USG-11	393209	181.5
USG-12	185364	90
USG-13	1706831	300
USG-14	408287	161
USG-15	1176968	115
USG-16	288000	17
USG-17	438362	230
USG-18	1263200	148
USG-19	2328907	620.36
USG-20	968227	350
USG-21	3975038.31	150
USG-22	7162682	380
USG-23	417301	152
USG-24	3741559	190
USG-25	519308	240
USG-26	2205135	60
USG-27	788589	240
USG-28	589258	103.5
USG-29	1244159	185
USG-30	80544	710
USG-31	555237	110
USG-32	738803	234
USG-33	9686897	705
USG-34	1946970	350
USG-35	1727699	172
USG-36	135110	120

Table 9: SPSS correlation table, cont.

Institution	7 Op $/GIE	8 Op $/GSF	9 E $/S.F.
USG-1	0.088421053	6.128255636	0.825668304
USG-2			
USG-3	0.052708076	3.962907343	2.918520871
USG-4	0.064161074	3.749049012	1.34118699
USG-5	0.071258807	4.333786805	2.046362851
USG-6	0.058040826	7.341114769	1.770985015
USG-7	0.037423192	3.380744629	2.081090218
USG-8	0.063353636	4.292145752	1.761441028
USG-9	0.086106874	3.758834827	1.324962343
USG-10	0.090760183	7.312886917	
USG-11	0.068810244	6.826969881	2.071944106
USG-12	0.041015437	2.905391554	2.008000475
USG-13	0.27007413	3.639320472	4.285991911
USG-14	0.124862186	13.05679583	2.512974942
USG-15	0.060300333	4.462491758	1.707658152
USG-16	0.072631579	4.791666667	1.736111111
USG-17	0.059514643	4.05555226	2.429569625
USG-18	0.107464493	12.0803974	1.811356295
USG-19	0.083755346	7.743858385	1.570224512
USG-20	0.164547547	2.986794419	1.34786264
USG-21	0.02918078	3.954859997	1.994133234
USG-22	0.028452825	3.894643096	2.343801937
USG-23	0.089132859	4.050632517	2.152327864
USG-24	0.093266222	4.304816254	0.846898044
USG-25	0.047798771	4.711636447	2.028461202
USG-26	0.010956197	2.932744707	2.863351741
USG-27	0.121864154	4.847899223	1.174440678
USG-28	0.058583159	4.409102634	2.242535528
USG-29	0.049973505	2.102433049	1.322682917
USG-30	0.087992969	8.527525328	3.025625745
USG-31	0.139536101	4.262720244	2.719747969
USG-32			3.610914983
USG-33		5.157255827	2.10272828
USG-34		3.981165606	1.65217185
USG-35		4.327276337	2.01773817
USG-36		6.216764118	1.515204643

Table 9: SPSS correlation table, cont.

Institution	10 Op $t+Util/SFTE	11 Const$/SFTE
USG-1	1084.50156	
USG-2	1009.692167	
USG-3	860.5221963	24.0338785
USG-4		
USG-5	938.6927692	38.69123077
USG-6	855.0564833	
USG-7	752.9724194	
USG-8	711.2455976	
USG-9	1218.146366	13.4914361
USG-10	244.5999559	6.619593998
USG-11	594.0965678	
USG-12	529.1765037	14.05283867
USG-13	2835.261406	10.27538019
USG-14	589.9953184	
USG-15	1304.721186	
USG-16	2351.81295	39.17985612
USG-17	819.4042733	33.44728704
USG-18	559.0138596	43.85964912
USG-19	1114.46939	76.76575025
USG-20	1631.860432	38.76409774
USG-21	988.1481107	187.0393419
USG-22	3110.551817	139.7780395
USG-23	699.0282393	
USG-24	1066.355554	36.34686878
USG-25	706.109881	
USG-26	5773.258591	126.6015886
USG-27	1609.06574	480.8752965
USG-28	742.1551559	19.30744213
USG-29	1232.571236	
USG-30		
USG-31	2549.984285	
USG-32	2124.049196	925.5773832
USG-33	1925.723538	108.1290532
USG-34	300.0384003	
USG-35	1058.47482	14.44254326
USG-36	1060.865482	

Table 9: SPSS correlation table, cont.

Institution	12 Const$%TlOp$-PU	13 Cust$/SFTE
USG-1		
USG-2		
USG-3	0.048498293	24.0338785
USG-4	0.05658984	
USG-5	0.060680953	38.69123077
USG-6		
USG-7		
USG-8		
USG-9	0.016844679	13.4914361
USG-10	0.02706294	6.619593998
USG-11		
USG-12	0.043921756	14.05283867
USG-13	0.005325946	10.27538019
USG-14		
USG-15		
USG-16	0.024001551	39.17985612
USG-17	0.064323445	33.44728704
USG-18	0.094627316	43.85964912
USG-19	0.105976666	76.76575025
USG-20	0.038056582	38.76409774
USG-21	0.278632083	187.0393419
USG-22	0.089350228	139.7780395
USG-23		
USG-24	0.04079079	36.34686878
USG-25		
USG-26	0.046826413	126.6015886
USG-27	0.371268447	480.8752965
USG-28	0.039455582	19.30744213
USG-29		
USG-30		
USG-31		
USG-32	0.34278021	925.5773832
USG-33	0.096870995	108.1290532
USG-34		
USG-35	0.020659871	14.44254326
USG-36		

Table 9: SPSS correlation table, cont.

Institution	14Cust$%TlOp$-PU	15 E$wPU/SFTE
USG-1		131.3100709
USG-2		303.1826901
USG-3	0.048498293	364.9608645
USG-4	0.05658984	
USG-5	0.060680953	301.0753846
USG-6		166.1846758
USG-7		279.6380045
USG-8		209.7803714
USG-9	0.016844679	417.2147563
USG-10	0.02706294	
USG-11		
USG-12	0.043921756	209.2248454
USG-13	0.005325946	1933.493218
USG-14		137.2411717
USG-15		356.927544
USG-16	0.024001551	719.4244604
USG-17	0.064323445	299.4183301
USG-18	0.094627316	100.3396053
USG-19	0.105976666	391.6409952
USG-20	0.038056582	613.2692669
USG-21	0.278632083	333.5334511
USG-22	0.089350228	1815.860419
USG-23		242.5515987
USG-24	0.04079079	175.2997898
USG-25		212.5067843
USG-26	0.046826413	3239.176233
USG-27	0.371268447	313.843104
USG-28	0.039455582	252.808877
USG-29		571.4413013
USG-30		
USG-31		1184.633581
USG-32	0.34278021	
USG-33	0.096870995	879.9524105
USG-34		300.0384003
USG-35	0.020659871	359.4122108
USG-36		257.7347716

Table 9: SPSS correlation table, cont.

Institution	16 E$wPU%TlOp$-PU	17 Grd$/SFTE
USG-1		57.12
USG-2		134.0815255
USG-3		109.9198306
USG-4		
USG-5		160.0117692
USG-6		94.41699411
USG-7		64.04806327
USG-8		138.9392302
USG-9		81.04716733
USG-10		46.47992056
USG-11	0.285140667	168.9328098
USG-12		79.70489039
USG-13	0.532594575	238.8828607
USG-14		73.46308186
USG-15		87.22695791
USG-16		230.2158273
USG-17		101.5912286
USG-18	0.010409005	34.95048246
USG-19	0.002120825	116.8342141
USG-20		194.943609
USG-21	0.024822027	14.86863587
USG-22	0.172395235	77.76071108
USG-23		82.26627059
USG-24		50.0420447
USG-25	0.001469154	90.95027234
USG-26	0.062713291	232.742893
USG-27		139.9481532
USG-28		57.27396212
USG-29		105.2297935
USG-30	0.036398526	
USG-31	0.30256251	173.5343259
USG-32	0.213375302	79.02461052
USG-33	0.063111287	126.1228459
USG-34		
USG-35		97.16060665
USG-36		216.0291878

Table 9: SPSS correlation table, cont.

Institution	18 Grd$%TlOp$-PU	19 Maint$/SFTE
USG-1	0.059925	633.3466667
USG-2	0.189780222	140.0059374
USG-3	0.221808732	185.3925234
USG-4	0.133427524	
USG-5	0.250952645	251.8231538
USG-6	0.137060325	182.6483301
USG-7	0.135312501	169.7398094
USG-8	0.27706653	176.3133018
USG-9	0.101191121	328.0349144
USG-10	0.190024239	
USG-11	0.203271997	204.8179174
USG-12	0.249115416	76.04609331
USG-13	0.123818013	529.9091656
USG-14	0.16225822	64.98033708
USG-15	0.092031592	434.2045818
USG-16	0.141030048	316.5467626
USG-17	0.195373029	180.6986224
USG-18	0.075405764	167.7191667
USG-19	0.161291988	263.5196247
USG-20	0.191385529	574.8298872
USG-21	0.022149773	224.9993268
USG-22	0.04970693	599.9067968
USG-23	0.18022011	158.6627059
USG-24	0.056160396	171.7832485
USG-25	0.183987202	171.897089
USG-26	0.086085134	858.2855351
USG-27	0.108049496	359.4290071
USG-28	0.117041785	156.5490721
USG-29	0.159166584	192.2401697
USG-30	0.065167921	
USG-31	0.088643412	461.4177006
USG-32	0.029266135	985.0866268
USG-33	0.11299133	370.10248
USG-34		
USG-35	0.138986988	270.3433794
USG-36	0.268983847	203.2906091

Table 9: SPSS correlation table, cont.

Institution	20 Maint$%TlOp$-PU	21 BTU/SF
USG-1	0.664448512	48323
USG-2	0.198165689	
USG-3	0.374106113	177611
USG-4	0.352657506	77313
USG-5	0.39494399	121523
USG-6	0.265141247	111067
USG-7	0.358604412	121626
USG-8	0.351596268	111112
USG-9	0.409566697	
USG-10		143950
USG-11	0.246451516	86171
USG-12	0.237679947	89118
USG-13	0.27466307	
USG-14	0.143522346	
USG-15	0.458121433	94782
USG-16	0.193916316	45546
USG-17	0.347506745	143310
USG-18	0.361854574	
USG-19	0.363794156	110972
USG-20	0.564338183	65256
USG-21	0.335180986	98874
USG-22	0.383478043	165829
USG-23	0.347581216	84021
USG-24	0.192786193	101947
USG-25	0.347737984	111385
USG-26	0.31745599	233942
USG-27	0.277503648	
USG-28	0.319914708	90874
USG-29	0.290775171	
USG-30	0.682446156	
USG-31	0.235697687	68838
USG-32	0.364818984	89690
USG-33	0.331568569	166886
USG-34		83326
USG-35	0.386722699	81389
USG-36	0.253122694	73783

APPENDIX D

SPSS PEARSON CORRELATIONS, ALL VARIABLES

Table 10: SPSS correlation analysis

		Sustaibility_ Score	Student_FTE	Gross_ Institutional_ Expenditure
Sustaibility_Score	Pearson Correlation	1	.592**	.659**
	Sig. (2-tailed)		.000	.000
	N	36	34	35
Student_FTE	Pearson Correlation	.592**	1	.725**
	Sig. (2-tailed)	.000		.000
	N	34	34	33
Gross_Institutional_ Expenditure	Pearson Correlation	.659**	.725**	1
	Sig. (2-tailed)	.000	.000	
	N	35	33	35
FM_FTE_Workers	Pearson Correlation	.670**	.872**	.906**
	Sig. (2-tailed)	.000	.000	.000
	N	34	33	33
GSF_Maintained	Pearson Correlation	.740**	.827**	.926**
	Sig. (2-tailed)	.000	.000	.000
	N	35	33	35
Total_Acres_Maintained	Pearson Correlation	.427**	.588**	.397*
	Sig. (2-tailed)	.009	.000	.018
	N	36	34	35
FM_Operating_Exp	Pearson Correlation	.723**	.905**	.867**
	Sig. (2-tailed)	.000	.000	.000
	N	35	33	34
Operating_Exp_by_GIE	Pearson Correlation	-.086	-.161	-.381*
	Sig. (2-tailed)	.650	.414	.038
	N	30	28	30
Operating_Exp_by_GSF	Pearson Correlation	-.036	.230	-.110
	Sig. (2-tailed)	.839	.205	.537
	N	34	32	34
Energy_Cost_by_SF	Pearson Correlation	.054	-.120	.076
	Sig. (2-tailed)	.762	.514	.669
	N	34	32	34
Oper_Cost_wUtil_by_SF	Pearson Correlation	.214	-.046	.484**
	Sig. (2-tailed)	.225	.794	.004
	N	34	34	33
Const_Cost_by_SFTE	Pearson Correlation	.113	-.070	.009
	Sig. (2-tailed)	.637	.770	.970
	N	20	20	20

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 10: SPSS correlation analysis, cont.

		FM_FTE_ Workers	GSF_ Maintained	Total_Acres_ Maintained
Sustaibility_Score	Pearson Correlation	.670**	.740**	.427**
	Sig. (2-tailed)	.000	.000	.009
	N	34	35	36
Student_FTE	Pearson Correlation	.872**	.827**	.588**
	Sig. (2-tailed)	.000	.000	.000
	N	33	33	34
Gross_Institutional_ Expenditure	Pearson Correlation	.906**	.926**	.397*
	Sig. (2-tailed)	.000	.000	.018
	N	33	35	35
FM_FTE_Workers	Pearson Correlation	1	.952**	.547**
	Sig. (2-tailed)		.000	.001
	N	34	33	34
GSF_Maintained	Pearson Correlation	.952**	1	.506**
	Sig. (2-tailed)	.000		.002
	N	33	35	35
Total_Acres_Maintained	Pearson Correlation	.547**	.506**	1
	Sig. (2-tailed)	.001	.002	
	N	34	35	36
FM_Operating_Exp	Pearson Correlation	.973**	.959**	.570**
	Sig. (2-tailed)	.000	.000	.000
	N	33	34	35
Operating_Exp_by_GIE	Pearson Correlation	-.272	-.155	.216
	Sig. (2-tailed)	.161	.413	.252
	N	28	30	30
Operating_Exp_by_GSF	Pearson Correlation	.000	-.138	.184
	Sig. (2-tailed)	.996	.437	.298
	N	32	34	34
Energy_Cost_by_SF	Pearson Correlation	-.052	-.006	.150
	Sig. (2-tailed)	.779	.971	.399
	N	32	34	34
Oper_Cost_wUtil_by_SF	Pearson Correlation	.236	.320	.031
	Sig. (2-tailed)	.185	.070	.863
	N	33	33	34
Const_Cost_by_SFTE	Pearson Correlation	-.018	-.027	.086
	Sig. (2-tailed)	.940	.911	.718
	N	20	20	20

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 10: SPSS correlation analysis, cont.

		FM_ Operating_ Exp	Operating_ Exp_by_GIE	Operating_ Exp_by_GSF
Sustaibility_Score	Pearson Correlation	.723**	-.086	-.036
	Sig. (2-tailed)	.000	.650	.839
	N	35	30	34
Student_FTE	Pearson Correlation	.905**	-.161	.230
	Sig. (2-tailed)	.000	.414	.205
	N	33	28	32
Gross_Institutional_ Expenditure	Pearson Correlation	.867**	-.381*	-.110
	Sig. (2-tailed)	.000	.038	.537
	N	34	30	34
FM_FTE_Workers	Pearson Correlation	.973**	-.272	.000
	Sig. (2-tailed)	.000	.161	.996
	N	33	28	32
GSF_Maintained	Pearson Correlation	.959**	-.155	-.138
	Sig. (2-tailed)	.000	.413	.437
	N	34	30	34
Total_Acres_Maintained	Pearson Correlation	.570**	.216	.184
	Sig. (2-tailed)	.000	.252	.298
	N	35	30	34
FM_Operating_Exp	Pearson Correlation	1	-.079	.077
	Sig. (2-tailed)		.677	.665
	N	35	30	34
Operating_Exp_by_GIE	Pearson Correlation	-.079	1	.182
	Sig. (2-tailed)	.677		.336
	N	30	30	30
Operating_Exp_by_GSF	Pearson Correlation	.077	.182	1
	Sig. (2-tailed)	.665	.336	
	N	34	30	34
Energy_Cost_by_SF	Pearson Correlation	-.013	.304	.036
	Sig. (2-tailed)	.942	.108	.841
	N	33	29	33
Oper_Cost_wUtil_by_SF	Pearson Correlation	.216	.049	-.312
	Sig. (2-tailed)	.228	.806	.082
	N	33	28	32
Const_Cost_by_SFTE	Pearson Correlation	.148	-.065	-.031
	Sig. (2-tailed)	.545	.804	.901
	N	19	17	19

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 10: SPSS correlation analysis, cont.

		Energy_Cost_by_SF	Oper_Cost_wUtil_by_SF	Const_Cost_by_SFTE
Sustaibility_Score	Pearson Correlation	.054	.214	.113
	Sig. (2-tailed)	.762	.225	.637
	N	34	34	20
Student_FTE	Pearson Correlation	-.120	-.046	-.070
	Sig. (2-tailed)	.514	.794	.770
	N	32	34	20
Gross_Institutional_Expenditure	Pearson Correlation	.076	.484**	.009
	Sig. (2-tailed)	.669	.004	.970
	N	34	33	20
FM_FTE_Workers	Pearson Correlation	-.052	.236	-.018
	Sig. (2-tailed)	.779	.185	.940
	N	32	33	20
GSF_Maintained	Pearson Correlation	-.006	.320	-.027
	Sig. (2-tailed)	.971	.070	.911
	N	34	33	20
Total_Acres_Maintained	Pearson Correlation	.150	.031	.086
	Sig. (2-tailed)	.399	.863	.718
	N	34	34	20
FM_Operating_Exp	Pearson Correlation	-.013	.216	.148
	Sig. (2-tailed)	.942	.228	.545
	N	33	33	19
Operating_Exp_by_GIE	Pearson Correlation	.304	.049	-.065
	Sig. (2-tailed)	.108	.806	.804
	N	29	28	17
Operating_Exp_by_GSF	Pearson Correlation	.036	-.312	-.031
	Sig. (2-tailed)	.841	.082	.901
	N	33	32	19
Energy_Cost_by_SF	Pearson Correlation	1	.405*	.259
	Sig. (2-tailed)		.021	.285
	N	34	32	19
Oper_Cost_wUtil_by_SF	Pearson Correlation	.405*	1	.198
	Sig. (2-tailed)	.021		.404
	N	32	34	20
Const_Cost_by_SFTE	Pearson Correlation	.259	.198	1
	Sig. (2-tailed)	.285	.404	
	N	19	20	20

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 10: SPSS correlation analysis, cont.

		Const_Cost_ TotalOper Cost	Cust_Cost_ by_SFTE	Cust_Cost_ TotalOper Cost
Sustaibility_Score	Pearson Correlation	.058	.113	.058
	Sig. (2-tailed)	.804	.637	.804
	N	21	20	21
Student_FTE	Pearson Correlation	.141	-.070	.141
	Sig. (2-tailed)	.553	.770	.553
	N	20	20	20
Gross_Institutional_ Expenditure	Pearson Correlation	.098	.009	.098
	Sig. (2-tailed)	.673	.970	.673
	N	21	20	21
FM_FTE_Workers	Pearson Correlation	.094	-.018	.094
	Sig. (2-tailed)	.692	.940	.692
	N	20	20	20
GSF_Maintained	Pearson Correlation	.063	-.027	.063
	Sig. (2-tailed)	.786	.911	.786
	N	21	20	21
Total_Acres_Maintained	Pearson Correlation	.141	.086	.141
	Sig. (2-tailed)	.543	.718	.543
	N	21	20	21
FM_Operating_Exp	Pearson Correlation	.167	.148	.167
	Sig. (2-tailed)	.481	.545	.481
	N	20	19	20
Operating_Exp_by_GIE	Pearson Correlation	-.111	-.065	-.111
	Sig. (2-tailed)	.662	.804	.662
	N	18	17	18
Operating_Exp_by_GSF	Pearson Correlation	.106	-.031	.106
	Sig. (2-tailed)	.655	.901	.655
	N	20	19	20
Energy_Cost_by_SF	Pearson Correlation	.025	.259	.025
	Sig. (2-tailed)	.917	.285	.917
	N	20	19	20
Oper_Cost_wUtil_by_SF	Pearson Correlation	.005	.198	.005
	Sig. (2-tailed)	.982	.404	.982
	N	20	20	20
Const_Cost_by_SFTE	Pearson Correlation	.854**	1.000**	.854**
	Sig. (2-tailed)	.000	.000	.000
	N	20	20	20

**. Correlation is significant at the 0.01 level (2-tailed).

Table 10: SPSS correlation analysis, cont.

		Energy_Cost_by_SFTE	Energy_Cost_by_TotalOperCost	Grounds_Cost_by_SFTE
Sustaibility_Score	Pearson Correlation	.236	.068	-.130
	Sig. (2-tailed)	.201	.835	.471
	N	31	12	33
Student_FTE	Pearson Correlation	-.035	-.552	-.420*
	Sig. (2-tailed)	.853	.078	.015
	N	31	11	33
Gross_Institutional_Expenditure	Pearson Correlation	.511**	-.287	-.071
	Sig. (2-tailed)	.004	.365	.700
	N	30	12	32
FM_FTE_Workers	Pearson Correlation	.246	-.322	-.166
	Sig. (2-tailed)	.189	.307	.364
	N	30	12	32
GSF_Maintained	Pearson Correlation	.340	-.166	-.115
	Sig. (2-tailed)	.066	.606	.530
	N	30	12	32
Total_Acres_Maintained	Pearson Correlation	.071	-.248	.016
	Sig. (2-tailed)	.705	.437	.930
	N	31	12	33
FM_Operating_Exp	Pearson Correlation	.215	-.248	-.172
	Sig. (2-tailed)	.246	.463	.346
	N	31	11	32
Operating_Exp_by_GIE	Pearson Correlation	.087	.755*	.382*
	Sig. (2-tailed)	.674	.012	.045
	N	26	10	28
Operating_Exp_by_GSF	Pearson Correlation	-.306	-.370	-.248
	Sig. (2-tailed)	.100	.263	.179
	N	30	11	31
Energy_Cost_by_SF	Pearson Correlation	.558**	.716**	.264
	Sig. (2-tailed)	.001	.009	.151
	N	30	12	31
Oper_Cost_wUtil_by_SF	Pearson Correlation	.961**	.219	.559**
	Sig. (2-tailed)	.000	.518	.001
	N	31	11	33
Const_Cost_by_SFTE	Pearson Correlation	.073	.077	-.086
	Sig. (2-tailed)	.775	.857	.719
	N	18	8	20

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 10: SPSS correlation analysis, cont.

		Grounds_ Cost_by_ TotalOper Cost	Maint_Cost_ by_SFTE
Sustaibility_Score	Pearson Correlation	-.362*	.261
	Sig. (2-tailed)	.033	.149
	N	35	32
Student_FTE	Pearson Correlation	-.425*	-.075
	Sig. (2-tailed)	.014	.682
	N	33	32
Gross_Institutional_ Expenditure	Pearson Correlation	-.391*	.295
	Sig. (2-tailed)	.022	.107
	N	34	31
FM_FTE_Workers	Pearson Correlation	-.362*	.184
	Sig. (2-tailed)	.038	.322
	N	33	31
GSF_Maintained	Pearson Correlation	-.387*	.204
	Sig. (2-tailed)	.024	.271
	N	34	31
Total_Acres_Maintained	Pearson Correlation	-.177	.119
	Sig. (2-tailed)	.308	.516
	N	35	32
FM_Operating_Exp	Pearson Correlation	-.388*	.191
	Sig. (2-tailed)	.023	.302
	N	34	31
Operating_Exp_by_GIE	Pearson Correlation	-.032	.183
	Sig. (2-tailed)	.868	.361
	N	30	27
Operating_Exp_by_GSF	Pearson Correlation	-.078	-.300
	Sig. (2-tailed)	.665	.108
	N	33	30
Energy_Cost_by_SF	Pearson Correlation	-.099	.339
	Sig. (2-tailed)	.582	.062
	N	33	31
Oper_Cost_wUtil_by_SF	Pearson Correlation	-.408*	.758**
	Sig. (2-tailed)	.018	.000
	N	33	32
Const_Cost_by_SFTE	Pearson Correlation	-.470*	.621**
	Sig. (2-tailed)	.036	.005
	N	20	19

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 10: SPSS correlation analysis, cont.

		Maint_Cost_by_TotalOperCost	BTUperSF
Sustaibility_Score	Pearson Correlation	-.042	.212
	Sig. (2-tailed)	.812	.280
	N	34	28
Student_FTE	Pearson Correlation	.049	.294
	Sig. (2-tailed)	.791	.137
	N	32	27
Gross_Institutional_Expenditure	Pearson Correlation	-.006	.586**
	Sig. (2-tailed)	.974	.001
	N	33	28
FM_FTE_Workers	Pearson Correlation	.077	.403*
	Sig. (2-tailed)	.676	.041
	N	32	26
GSF_Maintained	Pearson Correlation	-.027	.435*
	Sig. (2-tailed)	.882	.021
	N	33	28
Total_Acres_Maintained	Pearson Correlation	.358*	.222
	Sig. (2-tailed)	.038	.257
	N	34	28
FM_Operating_Exp	Pearson Correlation	-.024	.386*
	Sig. (2-tailed)	.896	.047
	N	33	27
Operating_Exp_by_GIE	Pearson Correlation	-.015	-.566**
	Sig. (2-tailed)	.939	.005
	N	29	23
Operating_Exp_by_GSF	Pearson Correlation	-.040	-.137
	Sig. (2-tailed)	.829	.497
	N	32	27
Energy_Cost_by_SF	Pearson Correlation	-.073	.479*
	Sig. (2-tailed)	.686	.011
	N	33	27
Oper_Cost_wUtil_by_SF	Pearson Correlation	-.015	.459*
	Sig. (2-tailed)	.933	.016
	N	32	27
Const_Cost_by_SFTE	Pearson Correlation	.002	-.077
	Sig. (2-tailed)	.995	.778
	N	19	16

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

APPENDIX E

PEARSON CORRELATIONS, 21 VARIABLES

Table 11: SPSS correlation table for 21 variables

APPA/USG Metric	APPA/ USG#	SPSS Data Name	Statistic	Value
N/A	N/A	Sustainability_Score	Pearson's Correlation Sig. (2-tailed) N	1 36
Student Official FTE Enrollment	1	Student_FTE	Pearson's Correlation Sig. (2-tailed) N	.592** .000 34
Gross Institutional Expenditures (Converted to DOL)	6	Gross_Institutional_Expenditure	Pearson's Correlation Sig. (2-tailed) N	.659** .000 35
Total Facilities FTE	2	FM_FTE_Workers	Pearson's Correlation Sig. (2-tailed) N	.670** .000 34
Building GSF Maintained by Facilities (Converted to GSF)	3	GSF_Maintained	Pearson's Correlation Sig. (2-tailed) N	.740** .000 35

Table 11: SPSS correlation table, cont.

Total Acres Maintained (Converted to ACRE)	**4**	**Total_Acres_Maintained**	**Pearson's Correlation** **Sig. (2-tailed)** **N**	**.427**** **.009** **36**
Annual Facility Operating Expenditure (Converted to DOL)	**5**	**FM_Operating_Exp**	**Pearson's Correlation** **Sig. (2-tailed)** **N**	**.723**** **.000** **35**
Facilities Operating Expenditures per GIE	**7**	**Operating_Exp_by_GIE**	**Pearson's Correlation** **Sig. (2-tailed)** **N**	**-.086** **.650** **30**
Facilities operating Expenditures per GSF	**8**	**Operating_Exp_by_GSF**	**Pearson's Correlation** **Sig. (2-tailed)** **N**	**-.036** **.839** **34**
Energy Total Cost per GSF with Purchased Utilities	**9**	**Energy_Cost_by_SF**	**Pearson's Correlation** **Sig. (2-tailed)** **N**	**.054** **.762** **34**
Total Cost All Op Functions w/PU per	**10**	**Oper_Cost_wUtil_by_SF (Note: This is actually per SFTE, not SF)**	**Pearson's Correlation** **Sig. (2-tailed)** **N**	**.214** **.225** **34**

Table 11: SPSS correlation table, cont.

Student				
Construction Cost per Student FTE	**11**	**Const_Cost_by_SFTE**	**Pearson's Correlation** **Sig. (2-tailed)** **N**	**.113** **.637** **20**
Constr Cost as Percent Total Operating Costs w/o Purch Utilities	**12**	**Const_Cost_TotalOperCost**	**Pearson's Correlation** **Sig. (2-tailed)** **N**	**.058** **.804** **21**
Custodial Total Cost per Student FTE	**13**	**Cust_Cost_by_SFTE**	**Pearson's Correlation** **Sig. (2-tailed)** **N**	**.113** **.637** **20**
Custod Cost as Percent Total Operating Costs wo Purch Utilities	**14**	**Cust_Cost_TotalOperCost**	**Pearson's Correlation** **Sig. (2-tailed)** **N**	**.058** **.804** **21**
Energy Cost per Student FTE with Purchased	**15**	**Energy_Cost_by_SFTE**	**Pearson's Correlation** **Sig. (2-tailed)** **N**	**.236** **.201** **31**

Table 11: SPSS correlation table, cont.

Energy Cost as Percent Total Operating Costs without Purch Utilities	**16**	**Energy_Cost_by_TotalOperCost**	**Pearson's Correlation** **Sig. (2-tailed)** **N**	**.068** **.835** **12**
Grounds Total Cost per Student FTE	**17**	**Grounds_Cost_by_SFTE**	**Pearson's Correlation** **Sig. (2-tailed)** **N**	**-.130** **.471** **33**
Grounds Cost as Percent Total Operating Costs wo Purch Utilities	**18**	**Grounds_Cost_by_Total OperCost**	**Pearson's Correlation** **Sig. (2-tailed)** **N**	**-.362*** **.033** **35**
Maintenance Total Cost per Student FTE	**19**	**Maint_Cost_by_SFTE**	**Pearson's Correlation** **Sig. (2-tailed)** **N**	**.261** **.149** **32**

Table 11: SPSS correlation table, cont.

Maint Cost as Percent Total Operating Costs wo Purch Utilities	**20**	**Maint_Cost_by_TotalOperCost**	**Pearson's Correlation** **Sig. (2-tailed)** **N**	**-.042** **.812** **34**
BTU/SF	**21**	**BTUperSF**	**Pearson's Correlation** **Sig. (2-tailed)** **N**	**.212** **.280** **28**

****Correlation is significant at the 0.01 level (2-tailed)**

*** Correlation is significant at the 0.05 level (2-tailed)**

APPENDIX F

OUTPUT OF SPSS STEPWISE REGRESSION FOR SEVEN VARIABLES

Syntax

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GET
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SAVE OUTFILE='I:\SPSS\SPSS Data (2).sav'
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REGRESSION
  /DESCRIPTIVES MEAN STDDEV CORR SIG N
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS CI(95) R ANOVA COLLIN TOL CHANGE ZPP
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT Sustaibility_Score
  /METHOD=ENTER GSF_Maintained
  /METHOD=STEPWISE GSF_Maintained FM_Operating_Exp
  /METHOD=STEPWISE GSF_Maintained FM_Operating_Exp FM_FTE_Workers
  /METHOD=STEPWISE GSF_Maintained FM_Operating_Exp FM_FTE_Workers Gross_Insti
tutional_Expenditure
  /METHOD=STEPWISE GSF_Maintained FM_Operating_Exp FM_FTE_Workers Gross_Insti
tutional_Expenditure Student_FTE
  /METHOD=STEPWISE GSF_Maintained FM_Operating_Exp FM_FTE_Workers Gross_Insti
tutional_Expenditure Student_FTE Total_Acres_Maintained
  /METHOD=STEPWISE GSF_Maintained FM_Operating_Exp FM_FTE_Workers Gross_Insti
tutional_Expenditure Student_FTE Total_Acres_Maintained
    Grounds_Cost_by_TotalOperCost
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  /SCATTERPLOT=(*ZRESID ,*ZPRED)
  /RESIDUALS DURBIN HIST(ZRESID) NORM(ZRESID)
  /CASEWISE PLOT(ZRESID) OUTLIERS(2)
  /SAVE PRED ZPRED ADJPRED MAHAL COOK LEVER ZRESID DRESID SDRESID SDBETA SDFI
T
  /OUTFILE=MODEL('I:\SPSS2\Exported Model Info, Day 2\Run 1.xml').
```

Regression

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Warnings

No variables were entered into the equation
No variables were entered into the equation
No variables were entered into the equation
No variables were entered into the equation

Table 12: SPSS descriptive statistics, 7 variables

	Mean	Std. Deviation	N
Sustaibility_Score	5.0333	5.88677	30
GSF_Maintained	1.5745E6	2.12241E6	30
FM_Operating_Exp	7.4039E6	1.02523E7	30
FM_FTE_Workers	110.8967	166.66522	30
Gross_Institutional_ Expenditure	1.5386E8	2.65588E8	30
Student_FTE	7691.0000	8124.26074	30
Total_Acres_Maintained	202.4567	147.28038	30
Grounds_Cost_by_Total OperCost	.149352	.0659040	30

Table 13: SPSS Pearson correlations for 7 variables

		Sustaibility_ Score	GSF_ Maintained	FM_ Operating_ Exp
Pearson Correlation	Sustaibility_Score	1.000	.751	.715
	GSF_Maintained	.751	1.000	.958
	FM_Operating_Exp	.715	.958	1.000
	FM_FTE_Workers	.682	.951	.974
	Gross_Institutional_ Expenditure	.672	.927	.864
	Student_FTE	.605	.825	.906
	Total_Acres_Maintained	.595	.673	.749
	Grounds_Cost_by_Total OperCost	-.420	-.508	-.461
Sig. (1-tailed)	Sustaibility_Score	.	.000	.000
	GSF_Maintained	.000	.	.000
	FM_Operating_Exp	.000	.000	.
	FM_FTE_Workers	.000	.000	.000
	Gross_Institutional_ Expenditure	.000	.000	.000
	Student_FTE	.000	.000	.000
	Total_Acres_Maintained	.000	.000	.000
	Grounds_Cost_by_Total OperCost	.011	.002	.005

Table 13: SPSS Pearson correlations for 7 variables, cont.

		FM_FTE_ Workers	Gross_ Institutional_ Expenditure	Student_FTE
Pearson Correlation	Sustaibility_Score	.682	.672	.605
	GSF_Maintained	.951	.927	.825
	FM_Operating_Exp	.974	.864	.906
	FM_FTE_Workers	1.000	.908	.870
	Gross_Institutional_ Expenditure	.908	1.000	.726
	Student_FTE	.870	.726	1.000
	Total_Acres_Maintained	.724	.533	.591
	Grounds_Cost_by_Total OperCost	-.433	-.503	-.504
Sig. (1-tailed)	Sustaibility_Score	.000	.000	.000
	GSF_Maintained	.000	.000	.000
	FM_Operating_Exp	.000	.000	.000
	FM_FTE_Workers	.	.000	.000
	Gross_Institutional_ Expenditure	.000	.	.000
	Student_FTE	.000	.000	.
	Total_Acres_Maintained	.000	.001	.000
	Grounds_Cost_by_Total OperCost	.008	.002	.002

Table 13: SPSS Pearson correlations for 7 variables, cont.

		Total_Acres_ Maintained	Grounds_ Cost_by_ TotalOper Cost
Pearson Correlation	Sustaibility_Score	.595	-.420
	GSF_Maintained	.673	-.508
	FM_Operating_Exp	.749	-.461
	FM_FTE_Workers	.724	-.433
	Gross_Institutional_ Expenditure	.533	-.503
	Student_FTE	.591	-.504
	Total_Acres_Maintained	1.000	-.117
	Grounds_Cost_by_Total OperCost	-.117	1.000
Sig. (1-tailed)	Sustaibility_Score	.000	.011
	GSF_Maintained	.000	.002
	FM_Operating_Exp	.000	.005
	FM_FTE_Workers	.000	.008
	Gross_Institutional_ Expenditure	.001	.002
	Student_FTE	.000	.002
	Total_Acres_Maintained	.	.270
	Grounds_Cost_by_Total OperCost	.270	.

Table 13: SPSS Pearson correlations for 7 variables, cont.

		Sustaibility_ Score	GSF_ Maintained	FM_ Operating_ Exp
N	Sustaibility_Score	30	30	30
	GSF_Maintained	30	30	30
	FM_Operating_Exp	30	30	30
	FM_FTE_Workers	30	30	30
	Gross_Institutional_ Expenditure	30	30	30
	Student_FTE	30	30	30
	Total_Acres_Maintained	30	30	30
	Grounds_Cost_by_Total OperCost	30	30	30

Table 13: SPSS Pearson correlations for 7 variables, cont.

		FM_FTE_ Workers	Gross_ Institutional_ Expenditure	Student_FTE
N	Sustaibility_Score	30	30	30
	GSF_Maintained	30	30	30
	FM_Operating_Exp	30	30	30
	FM_FTE_Workers	30	30	30
	Gross_Institutional_ Expenditure	30	30	30
	Student_FTE	30	30	30
	Total_Acres_Maintained	30	30	30
	Grounds_Cost_by_Total OperCost	30	30	30

Table 13: SPSS Pearson correlations for 7 variables, cont.

		Total_Acres_ Maintained	Grounds_ Cost_by_ TotalOper Cost
N	Sustaibility_Score	30	30
	GSF_Maintained	30	30
	FM_Operating_Exp	30	30
	FM_FTE_Workers	30	30
	Gross_Institutional_ Expenditure	30	30
	Student_FTE	30	30
	Total_Acres_Maintained	30	30
	Grounds_Cost_by_Total OperCost	30	30

Table 14: SPSS stepwise regression, variables entered/removed

Model	Variables Entered	Variables Removed	Method
1	GSF_ Maintained[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: Sustaibility_Score

Table 15: SPSS stepwise regression, model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.751[a]	.564	.549	3.95413

a. Predictors: (Constant), GSF_Maintained

b. Dependent Variable: Sustaibility_Score

Table 15: SPSS stepwise regression, model summary, cont.

Model	Change Statistics					Durbin-Watson
	R Square Change	F Change	df1	df2	Sig. F Change	
1	.564	36.276	1	28	.000	2.532

b. Dependent Variable: Sustaibility_Score

Table 16: SPSS stepwise regression ANOVA values

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	567.182	1	567.182	36.276	.000[a]
	Residual	437.785	28	15.635		
	Total	1004.967	29			

a. Predictors: (Constant), GSF_Maintained

b. Dependent Variable: Sustaibility_Score

Table 17: SPSS stepwise regression coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	1.753	.904		1.938	.063
	GSF_Maintained	2.084E-6	.000	.751	6.023	.000

a. Dependent Variable: Sustaibility_Score

Table 17: SPSS stepwise regression coefficients, cont.

Model		95.0% Confidence Interval for B		Correlations		
		Lower Bound	Upper Bound	Zero-order	Partial	Part
1	(Constant)	-.100	3.605			
	GSF_Maintained	.000	.000	.751	.751	.751

a. Dependent Variable: Sustaibility_Score

Table 17: SPSS stepwise regression coefficients, cont.

Model		Collinearity Statistics	
		Tolerance	VIF
1	GSF_Maintained	1.000	1.000

a. Dependent Variable: Sustaibility_Score

Table 18: SPSS stepwise regression, excluded variables

Model		Beta In	t	Sig.	Partial Correlation
1	FM_Operating_Exp	-.055[a]	-.124	.902	-.024
	FM_FTE_Workers	-.341[a]	-.843	.407	-.160
	Gross_Institutional_ Expenditure	-.168[a]	-.499	.622	-.096
	Student_FTE	-.046[a]	-.205	.839	-.039
	Total_Acres_Maintained	.164[a]	.973	.339	.184
	Grounds_Cost_by_Total OperCost	-.051[a]	-.346	.732	-.066

a. Predictors in the Model: (Constant), GSF_Maintained

b. Dependent Variable: Sustaibility_Score

Table 18: SPSS stepwise regression, excluded variables, cont.

Model		Collinearity Statistics		
		Tolerance	VIF	Minimum Tolerance
1	FM_Operating_Exp	.082	12.139	.082
	FM_FTE_Workers	.096	10.437	.096
	Gross_Institutional_ Expenditure	.141	7.084	.141
	Student_FTE	.320	3.128	.320
	Total_Acres_Maintained	.547	1.827	.547
	Grounds_Cost_by_Total OperCost	.742	1.348	.742

Table 19: SPSS stepwise regression, colliniarity diagnostics

Model	Dimension			Variance Proportions	
		Eigenvalue	Condition Index	(Constant)	GSF_ Maintained
1	1	1.602	1.000	.20	.20
	2	.398	2.007	.80	.80

a. Dependent Variable: Sustaibility_Score

Table 19: SPSS stepwise regression, colliniarity diagnostics, cont.

Case Number	Std. Residual	Sustaibility_ Score	Predicted Value	Residual
11	2.131	11.00	2.5719	8.42812
19	2.376	16.00	6.6053	9.39472
22	2.105	25.00	16.6774	8.32262

a. Dependent Variable: Sustaibility_Score

Table 20: SPSS stepwise regression, residuals statistics

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	1.9204	21.9371	4.7772	4.16689	35
Std. Predicted Value	-.704	3.822	-.058	.942	35
Standard Error of Predicted Value	.723	2.898	.906	.414	35
Adjusted Predicted Value	1.9204	29.9866	4.9202	5.04529	35
Residual	-6.93707	9.39472	.02284	3.81674	35
Std. Residual	-1.754	2.376	.006	.965	35
Stud. Residual	-2.579	2.467	-.008	1.052	35
Deleted Residual	-14.98661	11.43817	-.12021	4.73241	35
Stud. Deleted Residual	-2.900	2.739	.003	1.123	35
Mahal. Distance	.004	14.610	.864	2.657	35
Cook's Distance	.000	3.858	.158	.672	35
Centered Leverage Value	.000	.504	.030	.092	35

a. Dependent Variable: Sustaibility_Score

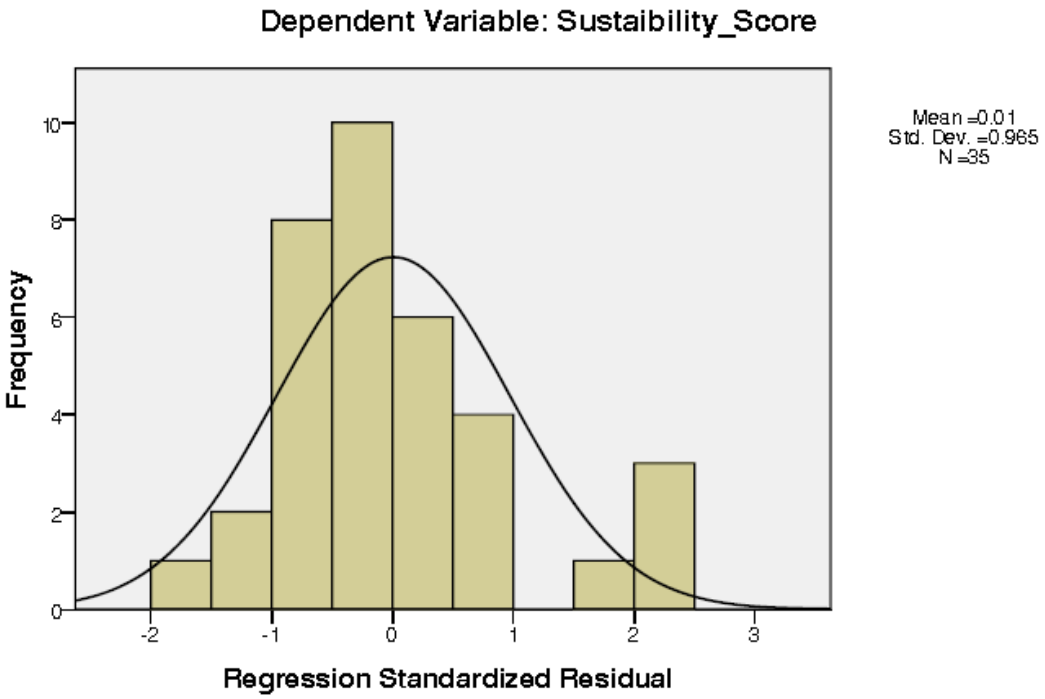

Figure 5: SPSS stepwise regression residuals histogram

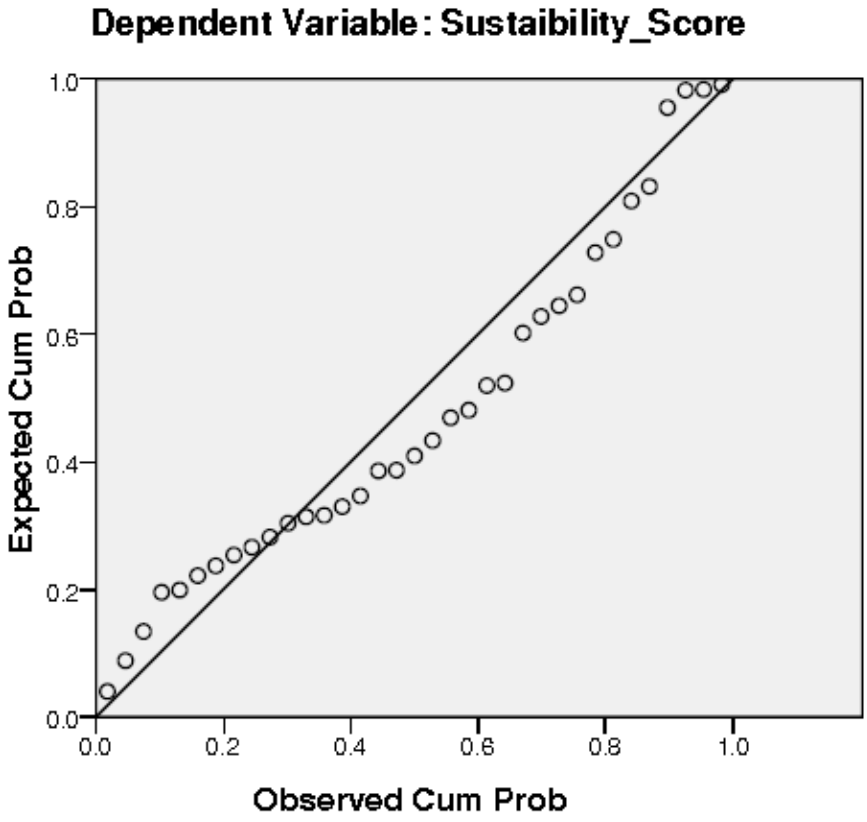

Figure 6: SPSS stepwise regression residuals histogram

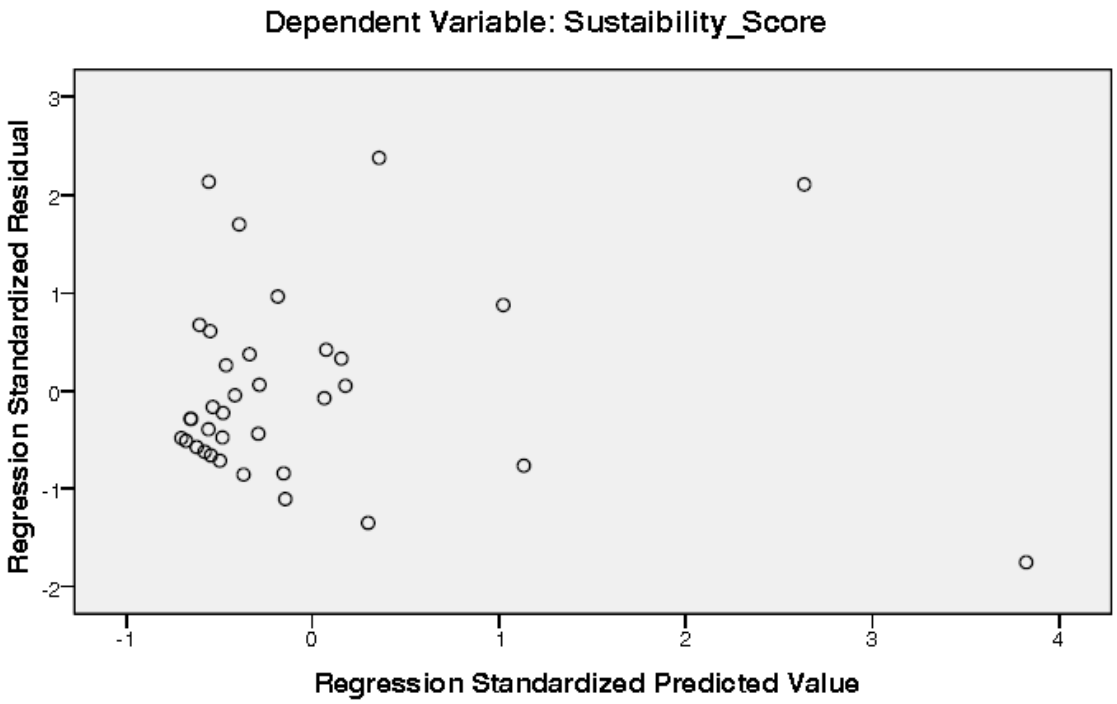

Figure 7: SPSS stepwise regression residuals scatterplot

APPENDIX G

DISCUSSION OF RESEARCH AND FINDINGS

There are many aspects of FM that affect whether facilities are owned and operated in a more or less environmentally sustainable way, and in so doing, whether or not FM contributes to the overall systemic sustainability of the organization. These aspects of FM sustainability practices are identified in the literature and are collectively conceptualized by this author as belonging to two classes of FM activities, the direct sustainability role and the indirect role. The direct role consists of the more tangible operational aspects of FM under the direct control of practitioners such as how efficiently buildings are operated, how waste streams are handled, whether buildings are constructed in environmentally sensitive ways, and what chemicals are used in the operations of buildings. The indirect sustainability role is less tangible, being comprised of functional aspects that many times reside in FM such as sustainability coordinators and project managers who can act as sustainability actors and advocates that use their job duties to connect other sustainability actors in the organization by providing sustainable projects, events and initiatives around which other sustainability actors in the organization can coalesce, thereby advancing systemic organizational sustainability.

Performance indicators currently used to assess FM performance in USG institutions of higher education and presumed to coincide with the direct sustainability role of FM are not found to significantly correlate with sustainability best practices observed in USG institutions and developed as an indicator of organizational sustainability for this research. However, increases in base metrics used in the development of FM performance indicators such as the number of square feet maintained

by the facility department at an institution are found to significantly correlate with higher sustainability best practices scores. As the scale of FM performance indicator base metrics increases in USG institutions, so do the sustainability practices of the institutions. Certainly causality is not proved by statistical correlation, but the inference of a relationship exists when supported by theory, and this one is.

The positive correlation of FM base metrics, which are a function of the physical size of the institution, and increased sustainability best practices might appear contradictory since larger physical footprints of facilities are by nature less environmentally sustainable. One explanation implied in this research for the contradiction is to take into account the indirect role of FM and the academic missions of the institutions, as discussed in the following.

The findings show that USG institutions with larger physical footprints are much more likely to engage in sustainability best practices. Perhaps this is as it should be: those with the least sustainable physical plants can reasonably be expected to do more to mitigate the environmental impact of those physical plants. And many believe, as previously discussed, that higher education must lead the way to a sustainable future. FM is inextricably intertwined with organizational sustainability. This author believes the greatest opportunity for FM to advance sustainability in organizations resides in FM's indirect role of sustainability, but further research is needed.

Even though no significant correlations for direct role metrics are found, 'base metrics' such as 'gross square feet maintained by the facility department' that quantify the scale of the FM operation rather than operational efficiencies, are found to be significantly correlated with sustainability best practices scores. In addition, although not

statistically correlated because it is not within the scope of this paper to do so, a pattern is observed where, as USG academic missions progress from foundational two and four year academic missions through those granting advanced degrees and performing research, sustainability best practices scores generally rise, regardless size of the institution as expressed in terms of student full time equivalent enrollment.

The USG classifies its institutions in five categories, Two Year State Colleges, Four Year State Colleges, State Universities, Regional Universities, and Research Universities. These classifications represent a progression in mission from access institutions to major research universities. Table 21 provides institutional sustainability best practices scores for USG institutions by institution type. Figures 8 trough 12 contrast Student Enrollment FTE with USG Sustainability best practice scores by category of institution. A cursory view of these graphs shows no obvious relationships between student enrollment FTE and sustainability best practices, with the possible exception of Regional Universities. However, there are only two universities in this category. But, a pattern is observed between institution mission and sustainability scores.

No sustainability best practices are found in 8 of 35 USG institutions representing 16.8% of USG student enrollment FTE. Of these, all but one are two and four year state colleges. A pattern is observed in that, with one exception, all two year state colleges score two or less on the sustainability best practices scale and all four year state colleges score five or less. This suggests that institutions with these missions might have greater difficulty establishing and/or maintaining sustainability best practices, and two year colleges appear to have greater difficulty than colleges with a four year mission. The one notable exception, a two year college that places 5th in descending rank order among

scoring institutions with a score of 11, appears to have sustainability championed by leadership in the college. Large enrollments in two and four year (foundational academic missions) institutions do not appear to aid those institutions in gaining sustainability best practices.

There are several reasons to expect that institutions with two and four year academic missions will not foster the FM indirect sustainability role. In USG institutions, two year and four year institutions focus on providing access to higher education and core instruction. First and second year course offerings are standardized across the system for a high degree of transferability among system institutions. Less diversity in course work exists and sustainability is only likely to be infused in core courses when and if encouraged from the system level. Research institutions and those offering advanced degrees enjoy a greater diversity of academic programs and freedom in course offerings, and can more easily include sustainability in courses and course offerings. Research is not a part of the 2 and 4 year college and state university academic missions, and a segment of sustainability best practices relates to research. Centers and endowed chairs of any kind, sustainability or otherwise, are found less often in two and four year institutions. Two year and four year institutions tend to have fewer students in residence and less a sense of campus life, offering fewer opportunities to promote sustainability as a part of student life and culture. Foundations for the promotion and advancement of academic and social focuses like sustainability are less prevalent. Often, physical and capital resources at institutions with foundational academic missions are more stressed, leaving fewer resources for sustainability projects and events, which often meet opposition as being frivolous or not central to the core mission of the institution. All

of these factors tend to inhibit the indirect sustainability role of FM in the foundational academic mission institutions. The converse for the factors discussed above make the indirect sustainability role of FM more likely to thrive in USG institutions with expanded academic missions.

While 7 of the 16 two and four year colleges showed no evidence of sustainability best practices, only one of the 13 state universities showed none. The remaining 12 state universities scored from 1 to 13 for the sustainability assessment. This is consistent with the pattern observed in the two and four year colleges: as the academic mission of the institution is expanded, sustainability best practices appear more often.

A natural tendency is to expect research institutions to lead in all areas of academic endeavor and best practices. Of course, this is not always the case. In this instance, sustainability best practice scores for the four USG research institutions are 1, 7, 15, and 25. While 15 and 25 are among the top three of all USG scores, the research institutions do not all rise to the top of the scoring range. Therefore, it appears that the research institution mission does not ensure a leadership position in sustainability best practices. It is interesting to note that the four research institutions have enrollments ranging from 2,329 to 33,831. The research institution trending toward the middle of the student FTE range scores the highest sustainability score in the USG system and the institution with the highest enrollment scores third in descending rank order among scoring institutions. So no obvious connection between size of regional institutions and sustainability best practices is observed. Other characteristics of the research institutions not identified in this study and beyond its scope undoubtedly play roles in the sustainability best practices of the institution, such as a high degree of research per

student, urban versus rural settings, or primary academic emphasis. Further research is needed to study these connections.

As opposed to the size of the institution in terms of student enrollment, the increased physical size of an institution (GSF maintained) is found in the correlation analysis to correlate with increased sustainability best practices in an organization. This and other FM metrics termed ‘base metrics’ for this analysis are a function of the physical size of the institution. This correlation is somewhat contradictory in that larger physical plants carry with them larger environmental impacts and are, by nature, less sustainable. The obvious explanation is that sustainability best practices are not demonstrated to equate with organizational sustainability, as previously discussed. This is an opportunity for further research.

Combining the findings of this research in terms of both the physical size and the missions of USG institutions, it could be that a stronger model for explaining organizational sustainability might involve both institutional mission and the size of the facility. Further research is needed in this area. It is found that just over half of the variation in sustainability best practices scores can be explained by the size of the facility via the correlation with increased quantities of space maintained by facility departments. Of course, additional influences also exist. The indirect role of FM in organizational sustainability could provide an explanation for the positive correlation between the FM base metrics and sustainability best practices scores, especially in combination with the increase in scores with the expanded academic missions.

Indicators more directly associated with the indirect sustainability role in FM are not currently captured in USG FM performance indicators. This is probably due to the

less tangible nature and the newness of the need for sustainability metrics and the complexity of defining and assessing sustainability. The impacts of the indirect FM sustainability role to organizational sustainability are not assessed in this research and can only be postulated. A correlation is not found between metrics associated with the direct sustainability role of FM in higher education, and further research is needed to confirm impacts of the indirect sustainability role. However, the findings of this research leave open the possibility that greater influences will be found to organizational sustainability through the indirect role of sustainability in FM. Data needed for this purpose will quantify aspects of FM resident in the activities of sustainability coordinators often employed in FM departments, of high sustainability performance construction projects, of sustainability events hosted by the FM department, of cooperative efforts between FM departments and sustainability academic programs, and the like. These kinds of metrics are currently not commonplace. There exists opportunity or further research to identify performance measures and assessment methods for the indirect sustainability role of FM.

Table 21: Sustainability best practices scores by USG type

Institution	Sustainability Best Practices Score	Student FTE	USG Type
INST 30	Excluded	0	Excluded
INST 24	13	18076	State University
INST 34	6	10677	State University
INST 9	7	7590	State University
INST 3	5	6848	State University
INST 5	2	6500	State University
INST 15	8	5631	State University
INST 28	4	5227	State University
INST 7	3	4931	State University
INST 32	10	4429	State University
INST 2	0	4379	State University
INST 29	1	3535	State University
INST 13	5	2433	State University
INST 20	4	2128	State University
INST 14	5	7476	State College, 4 Years
INST 25	0	4957	State College (4 Years)
INST 10	1	4532	State College (4 Years)
INST 23	0	3703	State College (4 Years)
INST 1	1	3525	State College (4 Years)
INST 8	0	2962	State College (4 Years)
INST 27	0	2951	State College (4 Years)
INST 16	5	695	State College (4 Years)
INST 19	16	16841	Regional University
INST 35	7	10286	Regional University
INST 33	15	33831	Research University
INST 21	7	23766	Research University
INST 22	25	17832	Research University
INST 26	1	2392	Research University
INST 18	0	22800	State College, 2 Years
INST 17	2	3557	State College, 2 Years
INST 11	11	3438	State College, 2 Years
INST 6	1	2036	State College, 2 Years
INST 12	1	1779	State College, 2 Years
INST 31	2	1209	State College, 2 Years
INST 36	0	788	State College, 2 Years
INST 4	0	Not Given	State College, 2 Years

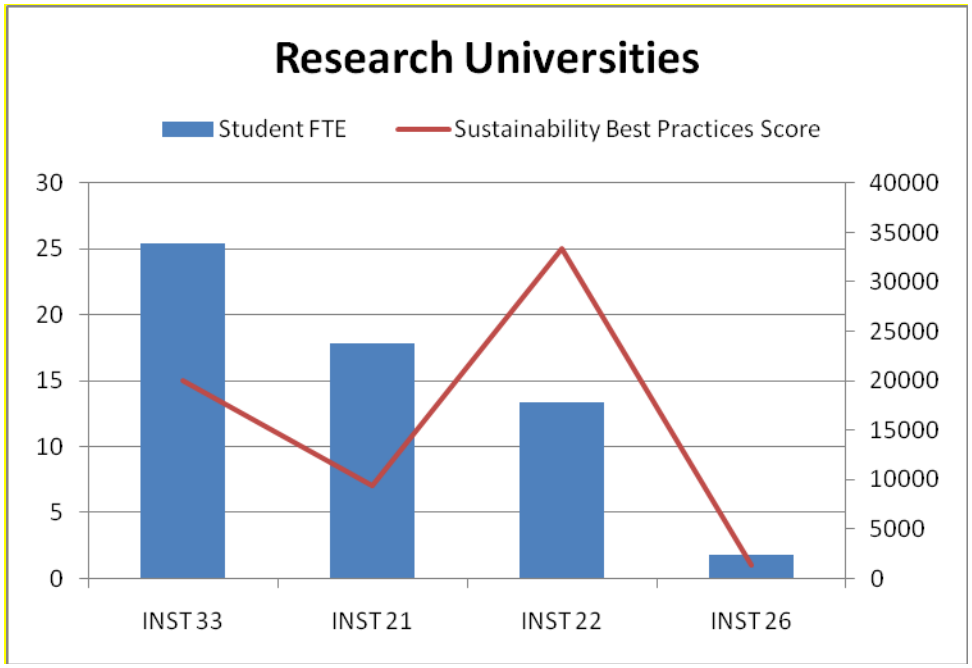

Figure 8: Student FTE v. SBP scores, research universities

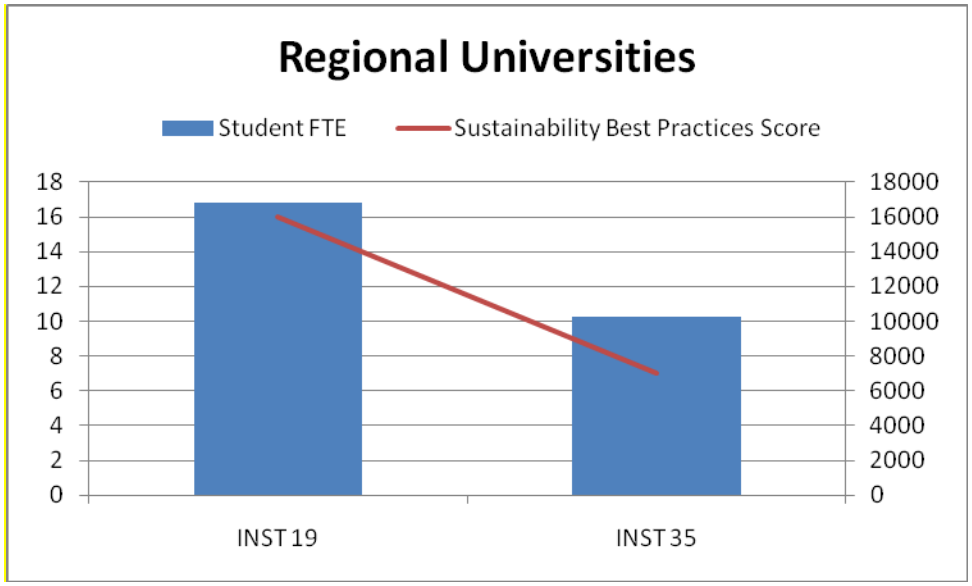

Figure 9: Student FTE v. SBP scores, regional universities

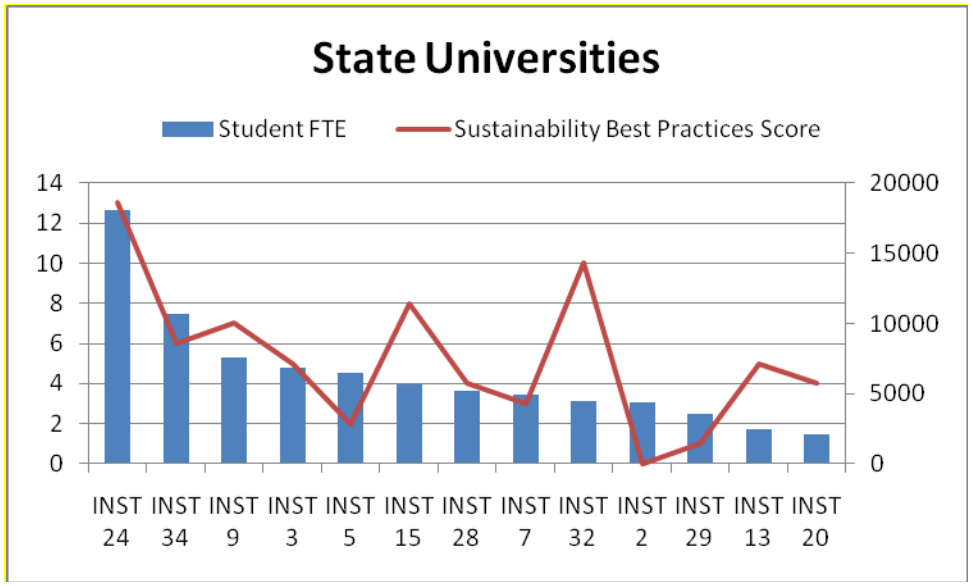

Figure 10: Student FTE v. SBP scores, state universities

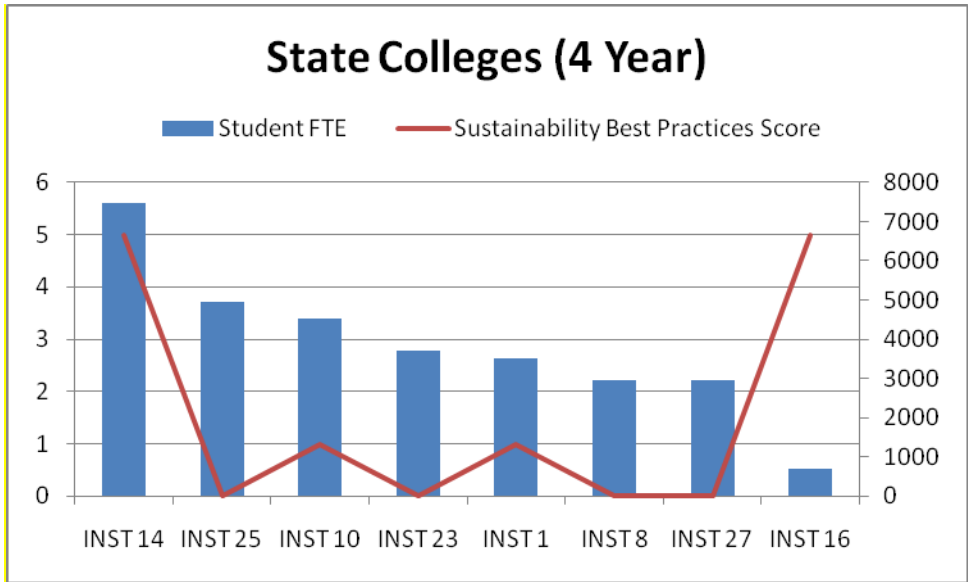

Figure 11: Student FTE v. SBP scores, 4 year state colleges

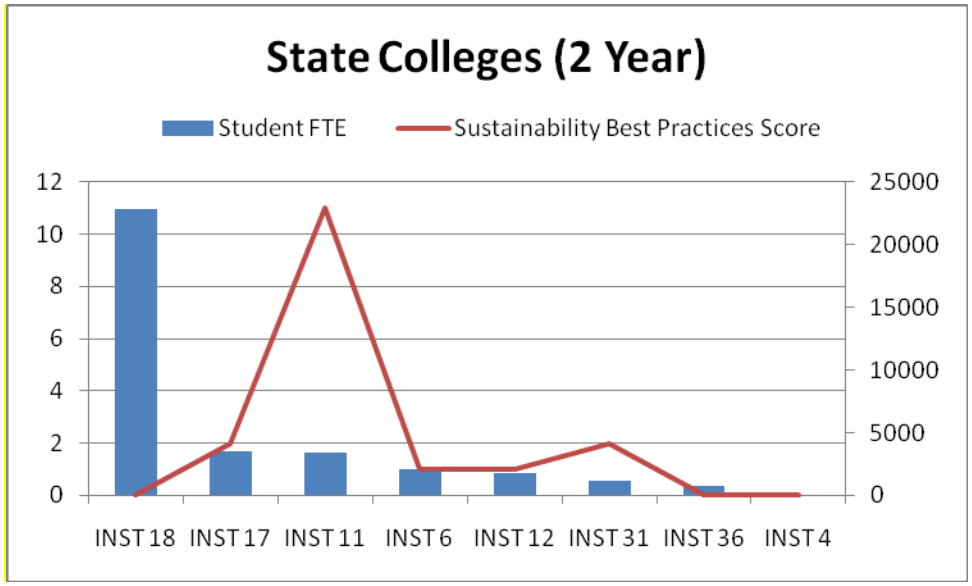

Figure 12: Student FTE v. SBP scores, 2 year state colleges

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